

***United States Court of Appeals
for the Second Circuit***



APPENDIX

NO - 77-4076

IN THE UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

RAY MARSHALL, SECRETARY OF LABOR,
Petitioner,

v.

WESTERN ELECTRIC, INC.,
and
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION,
Respondents.

ON PETITION TO REVIEW AN ORDER OF THE
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

JOINT APPENDIX

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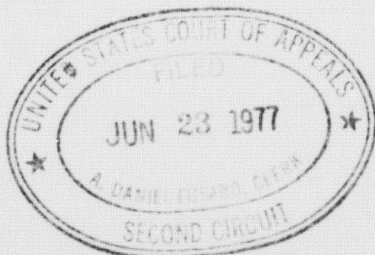
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UNITED STATES COURT OF APPEALS
FOR THE SECOND CIRCUIT

RAY MARSHALL, SECRETARY OF LABOR,	)	
	)	
Petitioner,	)	
	)	
v.	)	
	)	No. 77-4076
WESTERN ELECTRIC, INC., AND	)	
OCCUPATIONAL SAFETY AND HEALTH	)	
REVIEW COMMISSION,	)	
	)	
Respondents.	)	

CERTIFIED LIST OF THE OCCUPATIONAL SAFETY
AND HEALTH REVIEW COMMISSION

The Occupational Safety and Health Review Commission, by its Executive Secretary, certifies that the list set forth below constitutes a full and accurate transcript of the entire record of a proceeding had before said Commission and known upon its records as OSAHRC Docket No. 8902. This transcript includes the pleadings, testimony and evidence upon which the order of the Commission in said proceeding was entered, and includes also the findings and order of the Commission.

VOLUME I Exhibits introduced into evidence:

Secretary's (Complainant's) Exhibits 1 thru 3

Employer's (Respondent's) Exhibits 1 thru 17

VOLUME II Stenographic transcript of testimony taken before
Administrative Law Judge Paul E. Dixon on
January 8, 1975 -----

CERTIFIED
RECORD

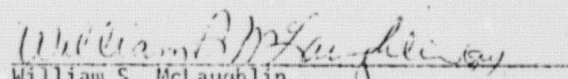
1-197

VOLUME III -- Pleadings

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| 1. Copy of Secretary's Citation, dated June 17, 1974 ----- | 1 |
| 2. Copy of Secretary's Notification of Proposed Penalty, dated
June 17, 1974 ----- | 1 |
| 3. Copy of Employer's Notice of Contest, dated July 10, 1974 ----- | 1 |
| 4. Copy of Secretary's Complaint, dated July 24, 1974 ----- | 1-4 |
| 5. Copy of Employer's Answer, dated August 5, 1974 ----- | 1-4 |
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Continuance, dated October 3, 1974 ----- | 1 |

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10. Copy of Administrative Law Judge's Order on Motion for Continuance and Notice of Hearing, dated November 22, 1974 ----- 1-4
11. Copy of Employer's Proposed Findings of Fact, Conclusions of Law and Post Hearing Brief, dated March 24, 1975 ----- 1-23
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13. Copy of Administrative Law Judge's Decision, dated August 14, 1975 ----- 1-13
14. Copy of Employer's Petition for Discretionary Review, dated August 12, 1975 ----- 1-7
15. Copy of Commissioner Moran's Direction for Review, dated August 25, 1975 ----- 1
16. Copy of Employer's Brief, dated November 21, 1975 ----- 1-20
17. Copy of Secretary's Brief, dated November 24, 1975 ----- 1-10
18. Copy of Commission's Decision, dated January 24, 1977 ----- 1-14

IN TESTIMONY WHEREOF, the Executive Secretary of the Occupational Safety and Health Review Commission, being duly authorized by the Occupational Safety and Health Review Commission, has hereunto set his hand and affixed the seal of the Occupational Safety and Health Review Commission in the City of Washington, District of Columbia, this 9th day of May 1977.


William S. McLaughlin
Executive Secretary
Occupational Safety and Health
Review Commission

(SEAL)

[3]

S-8492	98	71
AREA	REGION	
4120	7	

1627 MAIN STREET, ROOM 1100
KANSAS CITY, MISSOURI 64108

TO:
2. Western Electric
777 North Blue Parkway
Lee's Summit, Missouri 64063
Attention: Mr. J. H. Pursel,
General Manager

CERTIFIED

Subject: Citation(s) for Alleged Occupational Safety and Health Violation(s)

An inspection of a place of employment has revealed conditions which we believe do not comply with the provisions of the Occupational Safety and Health Act of 1970, (29 U.S.C. 651 *et seq.*). The nature of such alleged violation(s) is described in the enclosed citation(s) with references to applicable standards, rules, regulations and provisions of the said Act. These conditions must be corrected on or before the date shown to the right of each alleged violation therein.

The Act requires that a copy of the enclosed citation(s) be prominently posted "in a conspicuous place upon receipt" at or near each place a violation referred to in the citation occurred. It must remain posted until all violations cited therein are corrected, or for 3 working days*, whichever period is longer. A sufficient number of copies of the attached citation(s) should be prepared to permit posting in accordance with the requirements of the Act. The Act provides for penalties for violation of the posting requirements.

You are hereby notified, or will soon be notified, whether or not penalty(ies) will be proposed as a result of the cited violation(s). You have the right to contest any or all parts of either the citation(s) or the proposed penalty(ies) before the Occupational Safety and Health Review Commission. The Review Commission is an independent agency with authority to issue decisions regarding citation(s) and proposed penalty(ies). If you do contest, you should submit a letter to the Area Director at the address shown above within 15 working days* after receipt of the certified mail notice regarding proposed penalty(ies). If you fail to contest within the 15 working day period, the citation(s) and the penalty(ies) as proposed, shall be deemed to be a final order of the Review Commission and not subject to review by any court or agency.

If an employer contests the citation, the abatement period specified therein does not begin to run until the date of the Commission's final order in the case *PROVIDED* the employer initiated his contest in good faith and not solely for delay or avoidance of penalties.

You have a right to request a discussion with the Area Director concerning any results of the inspection (abatement dates, citations, penalties, etc.). Please direct correspondence to, or call, the Area Director at the address shown at the top of this letter. A request for an informal discussion cannot extend the 15 working day period allowed for filing a notice of contest. Therefore, a request for an informal discussion should be brought to the attention of the Area Director prior to the end of the 15 working days allowed for filing a notice of contest, preferably as soon as possible.

An employee or representative of employees may file a notice (letter) to contest the reasonableness of the time stated in the citation for the abatement of the alleged violation(s).

Alleged violations that are not contested shall be corrected within the abatement period specified in the citation. A followup inspection may be made for the purpose of ascertaining that the employer has posted the citation(s) as required by the Act and corrected the alleged violations. Failure to correct an alleged violation within the abatement period may result in further proposed penalties for each day the alleged violation has not been corrected. Timely correction of an alleged violation does not affect the initial proposed penalty.

Correction of alleged violations which have an abatement period of 30 days or less should be reported in writing to the Area Director promptly upon correction. Reports of corrections should show specific corrective action on each such alleged violation and the date of such action. On alleged violations having an abatement date of more than 30 days, a written progress report should be submitted each 30 days. The progress report should detail what has been done, what remains to be done, and the time needed to fully abate each such violation. When the alleged violation is fully abated, the Area Director should be so advised.

The Act provides that whoever knowingly gives false information is subject to a fine up to \$10,000, imprisonment up to 6 months, or both.

If you wish additional information, you may direct such request to the undersigned at the address shown above.

*Under the Occupational Safety and Health Act, the term "Working Day" means Mondays through Fridays but does not include Saturdays, Sundays, or Federal Holidays.

Citation(s) Enclosed		Pages
Quantity		
1	Nonserious	1
	Serious	
	Willful	
	and/or	
	Repeated	

1. Notification of Proposed Penalty enclosed

U.S. Department of Labor
by Area Director

5. *Robert J. Borchardt*
Robert J. Borchardt
June 17, 1971

U.S. DEPARTMENT OF LABOR
Occupational Safety and Health Administration

OSHA NO.	OSHA-1 NO.	BY
S-8492	98	71
AREA	REGION	
4120	7	

CITATION

1627 MAIN STREET, ROOM 1100
KANSAS CITY, MISSOURI 64103

[4]

TO: 2.

Western Electric
777 North Blue Parkway
Lee's Summit, Missouri 64083

3. Citation Number 2

4. Page 1 of 5. 1

6.
TYPE OF ALLEGED VIOLATION(S): NONSERIOUS

7.
An inspection was made on May 31, 1974 of a place of employment located at:

8. 777 North Blue Parkway, Lee's Summit, Missouri and described as follows:

9. Manufactures component parts and assemblies electronic devices.

On the basis of the inspection it is alleged that you have violated the Occupational Safety and Health Act of 1970, 29 U.S.C. 651 *et seq.*, in the following respects:

10. Item number	11. Standard, regulation or section of the Act allegedly violated	12. Description of alleged violation	13. Date by which alleged violation must be corrected
1.	29 CFR 1910.93g (c)(1)	Employer uses a coating, Hysol Coating CG7-4331, containing polyvinyl chloride and did not monitor the ambient air of the area to determine whether it contains vinyl chloride in concentrations in excess of 50 ppm. (Inductor, Building 50, vicinity of column G-7). The above alleged violation is cited from 29 CFR 1910.93g, Emergency Standard for Vinyl Chloride, as appears in the Federal Register, Volume 39, Number 67 dated April 5, 1974.	July 19, 1974

BEST COPY AVAILABLE

The law requires that a copy of this citation shall be prominently posted in a conspicuous place at or near each place that an alleged violation referred to in the citation occurred. The citation must remain posted until all alleged violations cited therein are corrected, or for 3 working days*, whichever period is longer.

RIGHTS OF EMPLOYEE

Any employee or representative of employees who believes that any period of time fixed in this citation for the correction of a violation is unreasonable has the right to contest such time for correction by submitting a letter to the U.S. Department of Labor at the address shown above within 15 working days* of the issuance of this citation.

*No person shall discharge or in any manner discriminate against any employee because such employee has filed any complaint or instituted or caused to be instituted any proceeding under or related to this Act or has testified or is about to testify in such proceeding or because of the exercise by such employee on behalf of himself or others of any right afforded by this Act." Sec. 11(c) (1) of the Occupational Safety and Health Act of 1970, 29 U.S.C. (51, 660(c)(1).

1627 MAIN STREET, ROOM 1100
KANSAS CITY, MISSOURI 64108

[5]

4120

7

TO: Western Electric
777 North Blue Parkway
Lee's Summit, Missouri 64063
Attention: Mr. J. H. Pursel,
General Manager

3. Date June 17, 1974

THERE IS NO REQUIREMENT THAT
THIS NOTIFICATION BE POSTED.

NOTIFICATION OF PROPOSED PENALTY

This notification and the penalty(ies) proposed by the Secretary of Labor shall be deemed to be the final order of the Occupational Safety and Health Review Commission (an independent agency with authority to issue decisions respecting citations and proposed penalties) and not subject to review by any court or agency unless, within 15 working days from the date of receipt of this notification, you submit a letter of contest. The letter of contest should be mailed or otherwise delivered to the Area Director named below at the address shown at the top of this notification. If no notice of contest is filed within the 15 working day period the proposed penalty(ies) becomes final and is immediately payable.

Payment of all penalties shown is to be made by check or money order payable to the order of "Occupational Safety and Health-Labor". Payment of penalties should be remitted to the Area Director at the address shown above.

Section 17(1) of the Act states: "Civil penalties owed under this Act shall be paid into the Treasury of the United States and shall accrue to the United States and may be recovered in a civil action in the name of the United States brought in the United States district court for the district where the violation is alleged to have occurred or where the employer has its principal office."

On the 17th day of June, 1974, a citation(s) was issued to you in accordance with the provisions of Section 8(a) of the Occupational Safety and Health Act of 1970 (84 Stat. 1601; 29 U.S.C. 651, et seq.) hereinafter referred to as the Act. You were thus notified of certain alleged violations of the Act, as specified in that citation(s).

YOU ARE HEREBY NOTIFIED that pursuant to the provisions of Section 10(a) of the Act, the penalty(ies) set forth below is/are being proposed, based on the citation(s).

VIOLATIONS			NONSERIOUS VIOLATIONS		
5A. Citation No.	5B. Item No.	5C. Proposed Penalty	6A. Citation No.	6B. Item No.	6C. Proposed Penalty
102			2	1.	\$30.00

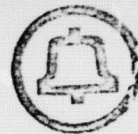
050-690-740

App'd to [Signature]
6/20/74

7. Total Proposed Penalty for
All Alleged Violations \$30.00

Area Director Date
Robert J. Porchardt June 17, 1974

The proposed penalty for Nonserious Violations of safety and health standards reflects a 50 percent adjustment factor for corrective action to be taken within the period prescribed in the citation. If a particular alleged violation is not corrected within this period, the 50 percent adjustment will be added to such other penalty as may subsequently be proposed for failure to correct a violation within the abatement period. No abatement credit is allowed for violations of record-keeping or posting requirements.



[6]

Western Electric

777 North Blue Parkway
Lee's Summit, Mo. 64083
816 251-5601

J. H. Fursel
General Manager
Kansas City Works

July 10, 1974

MR. R. J. BORCHARDT, Area Director
Occupational Safety and Health Administration
1627 Main, Room 1100
Kansas City, Missouri 64108

Re: Notice of Contest
Western Electric Company, Inc.
Kansas City Works

Dear Mr. Borchardt:

Western Electric Company, Inc., hereby contests all of the citation of a violation of 29 C.F.R. 1910.93q (c) (1) and the notice of proposed penalty resulting from an inspection by the Occupational Safety and Health Administration on May 31, 1974, at the Kansas City Works.

General Manager

bcc:

JUL 15 1974
V. J. Meyers - 222 Broadway

BEST COPY AVAILABLE

UNITED STATES OF AMERICA
 OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

 PETER J. LEWIS, SECRETARY OF LABOR, :
 UNITED STATES DEPARTMENT OF LABOR, :

OSHA DOCKET
 NO. 3902

v. :

WESTERN ELECTRIC, :

Respondent.

COMPLAINT

Inspection has disclosed that, at the times and in the manner hereinafter stated, the provisions of section 5(a)(2) of the Occupational Safety and Health Act of 1970 (29 U.S.C. 651 et seq.), hereinafter referred to as the Act, and the Occupational Safety and Health Standards promulgated thereunder (29 CFR Part 1910) have been violated. It is, therefore, charged that:

I.

Respondent, Western Electric, is a corporation with an office and principal place of business located at 777 North Blue Parkway, Lee's Summit, Missouri, where it is engaged in manufacturing electronic components.

II

Respondent employs approximately 5076 employees in its activities

at its aforesaid workplace in Lee's Summit, Missouri, and is engaged in a business affecting commerce. Respondent is an employer within the meaning of the Act.

III

As a result of an inspection by an authorized representative of the Secretary, respondent was issued a citation for other than serious violation and a notification of proposed penalty on June 17, 1974, pursuant to section 9(a) of the Act. Such citation and notification of proposed penalty were received by respondent on June 18, 1974. On July 11, 1974, respondent filed with a representative of the Secretary a notice of intent to contest the citation for other than serious violation and the notification of proposed penalty therefor pursuant to section 10(c) of the Act. This notice was duly transmitted to the Occupational Safety and Health Review Commission. Jurisdiction of this proceeding is conferred upon the Commission by section 10(c) of the Act.

IV

On May 31, 1974, at respondent's aforesaid workplace in the Inductor, Building 50, near column G-7, respondent, an employer of employees working in an area or operation in which vinyl chloride was manufactured, reacted, handled, processed, released, repacked, or stored, failed to begin monitoring the ambient air of said area to determine whether it contained vinyl chloride in concentrations in excess of 50 p.p.m., in violation of 29 CFR 1910.93q(c)(1). At least one of

respondent's employees was affected by this violation. The citation fixed an abatement date of July 19, 1974, and the penalty proposed was \$30.

V

In determining the amount of the proposed penalty, due consideration was given to the size of the business of respondent, the gravity of the violations, the good faith of respondent, and the history of previous violations, as required by section 17(j) of the Act. The abatement period fixed was the shortest possible time in which it was believed abatement could be practicably accomplished.

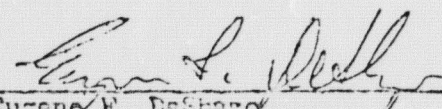
VI

To the extent that the language of the complaint may be inconsistent with the citation in this proceeding, the citation is deemed to be amended accordingly. The descriptions of the alleged violations in paragraph IV of this complaint were rephrased for purposes of clarification.

WHEREFORE, it is submitted on behalf of the Secretary that said citation and proposed penalty be affirmed.

William J. Kilberg
Solicitor of Labor

T. A. Housh, Jr.
Regional Solicitor


Eugene F. DeShazo
Attorney

Room 2106, 911 Walnut Street
Kansas City, Missouri 64106
(916) 374-2281

Attorneys for Peter J. Brennan
Secretary of Labor, United
States Department of Labor

NOTICE TO RESPONDENT

You are hereby notified that you must plead or otherwise answer this complaint, either denying or admitting the allegations, within 15 days of your receipt of this complaint. Failure to do so may result in dismissal of your notice of contest. See Rule 33(b), Rules of Procedure, Occupational Safety and Health Review Commission.

CERTIFICATE OF SERVICE

I, Eugene F. DeShazo, hereby certify that copies of the foregoing complaint were mailed to Mr. J. H. Pursel, General Manager, Western Electric, 777 North Blue Parkway, Lee's Summit, Missouri 64063, by certified mail, return receipt requested, this 27 day of July, 1974.


Eugene F. DeShazo

UNITED STATES OF AMERICA
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

PETER J. BRENNAN, SECRETARY OF LABOR,
UNITED STATES DEPARTMENT OF LABOR,

v.

WESTERN ELECTRIC,

Respondent.

OSHRC DOCKET
NO. 8902

ANSWER

Respondent, Western Electric Company, Inc. (named in the caption as Western Electric), answers the Complaint as follows:

1. Denies the allegations in the Preamble.
2. Admits it is a corporation with an office and place of business at 777 North Blue Parkway, Lee's Summit, Missouri, where it engages in the manufacture of electronic components.
3. Admits the allegations in Paragraph II of the Complaint.
4. Admits the allegations in Paragraph III, except it has no knowledge that the notice of contest was duly transmitted to the Commission.

5. Respondent admits that it did not begin to monitor the ambient air in the Inductor, Building 50, near Column G-7 to determine whether it contained vinyl chloride in excess of 50 p.p.m.
6. Respondent denies any employees were affected by its actions described in Paragraph 5 of the Answer.
7. Respondent denies it is, or was an employer of employees working in an area of operation in which vinyl chloride was manufactured, reacted, handled, processed, released, repacked or stored, in the part of the work place described in the Complaint as Inductor, Building 50, near Column G-7.
8. Respondent admits that the citation fixed an abatement date of July 19, 1974, and that the penalty proposed was \$30.
9. Respondent denies Paragraphs V and VI of the Complaint.
10. Respondent affirmatively states that 29 C.F.R. 1910.93a is inapplicable to the operation cited and named in Paragraph IV of the Complaint because the section does not apply to the handling, storage or other use of vinyl chloride polymers and copolymers in the form of fabricated products.

WHEREFORE, Respondent submits that the citation and proposed penalty be vacated and set aside.

BERNARD M. HARTNETT, JR.

LAUREL J. MCKEE

195 Broadway
New York, N.Y. 10007
212-471-6458

ATTORNEYS FOR RESPONDENT
WESTERN ELECTRIC COMPANY, INC.

CERTIFICATE OF SERVICE

I, Laurel J. McKee, hereby certify that a copy of the foregoing Answer was mailed to Eugene F. DeShago, Attorney, Office of the Regional Solicitor, U. S. Department of Labor, Room 2106, 911 Walnut Street, Kansas City, Missouri 64106, by certified mail, return receipt requested, this 5th day of August, 1974.

LAUREL J. MCKEE

Title 29—Labor

CHAPTER XXV—OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Emergency Temporary Standard for Exposure to Vinyl Chloride

1. *Background.* Vinyl chloride (chloroethene), Chemical Abstracts Service Registry No. 75495, is a synthetic chemical made by oxychlorination of ethylene or by hydrochlorination of acetylene. It is the principal compound of a series of thermoplastic resin polymers and copolymers which are widely used for containers, wrapping films, electrical insulation, pipe, conduit and a variety of other products. Vinyl chloride has been made commercially in this country since 1925 and present production is in excess of seven billion pounds per year.

Vinyl chloride (VC) is a gas at ambient temperature and pressure and is a chlorinated hydrocarbon which has moderate liver toxicity. The present standard sets a ceiling value of 250 parts per million (ppm) (2.9 GRN 116681).

On January 22, 1974, the Occupational Safety and Health Administration was informed by the National Institute for Occupational Safety and Health (NIOSH) that the B. F. Goodrich Chemical Company reported that deaths of several of its employees from a rare form of liver cancer may have been occupationally related. As a result of this notification, and after consultation with NIOSH and a joint inspection of the plant by OSHA, NIOSH, and the Kentucky Department of Labor, a fact-finding hearing on possible hazards involved with the manufacture and use of both VC and polyvinyl chloride was announced on January 30, 1974 (29 FR 3874), and held on February 15, 1974.

2. *Carcinogenicity of VC.* Information produced at the hearing demonstrated that exposure of laboratory animals (mostly Sprague-Dawley rats) to VC by inhalation at and below the current OSHA standard of 500 ppm induced tumors, including angiosarcomas of the liver. Professor Cesare Maltoni, of the Istituto di Oncologia, Bologna, Italy, reported on a series of experiments on the effect of exposure of rats, mice, and hamsters to VC at concentrations of 10,000; 6,000; 2,500; 500; 250; and 50 ppm for varying periods of time (2R 43-63). Some of the experiments have been concluded, and others are still ongoing. The experimental results so far reported are that tumors have been observed in groups of animals exposed to VC at concentrations as low as 250 ppm. No tumors have been observed in the group of animals exposed to VC at a concentration of 50 ppm. It also appears so far that the total number of tumors, as well as the numbers of angiosarcomas of the liver, decrease as the concentrations of VC are reduced to 250 ppm. Finally, another experiment by Professor Maltoni is underway involving the exposure of 300 animals to VC at concentrations of

50 ppm, in order to assess in a more definitive way whether that level of exposure produces tumors in animals. Data reported by Terhosh, Oyon and Chow (American Industrial Hygiene Association J 33:354-361 (1972)) indicate that exposure to VC at concentrations of 50 ppm failed to induce tumors in rats, hamsters, rabbits, and dogs.

The employees of the B. F. Goodrich Chemical Company who died from angiosarcoma of the liver had an average exposure of approximately 19 years to vinyl chloride, at unknown concentrations, and variable exposures to other volatile chemicals (2R 50). Some employees of Union Carbide Company and Goodrich Company are also reported in a post-hearing comment from NIOSH dated March 11, 1974, to have had exposure to vinyl chloride and to have died from angiosarcoma of the liver. Finally, autopsies of four deceased employees revealed that liver angiosarcoma tumors were histologically indistinguishable from the angiosarcoma tumors observed in Professor Maltoni's experimental animals. It is concluded therefore, that vinyl chloride is carcinogenic for humans.

We therefore conclude that the present standard for VC should be lowered from a ceiling of 500 ppm to a ceiling of 50 ppm for the following reasons:

(a) In light of the evidence referred to above including the Mutual experiments demonstrating that VC is carcinogenic in animals at 250 ppm, we conclude that VC must be considered carcinogenic to humans at the same level.

(b) Although Professor Maltoni did not induce tumors in his experimental animals at an exposure concentration of 50 ppm, these data do not support the concept that occupational exposure of employees to concentrations of 50 ppm throughout their working lifetime would be without detrimental health effects.

(c) The question whether safe levels of exposure to carcinogens exist for humans and, if so, what such levels would be, is the subject of continuing scientific deliberation. In the case of VC, Professor Maltoni did not observe tumors in his animals at exposure concentrations of 50 ppm. In addition, Terhosh, Oyon, and Rowe found that exposure to concentrations of 50 ppm of VC failed to induce tumors in rats, hamsters, rabbits, and dogs. Accordingly, there is insufficient evidence at this time to conclude that VC at concentrations of 50 ppm or below poses a grave danger to humans.

(d) The emergency temporary standard adopted represents a substantial reduction in the permissible level of exposure and, in our practical judgment, is the lowest level that can be complied with immediately; and

(e) This standard will be in effect for a period of no longer than six months, during which time the whole question of possible safe exposure of humans to VC will be reconsidered more fully and in the light of more information, including experiments which are under way at this time (2R 47, 43, 71-74).

3. *Petitions for an emergency tempo-*

rary standard. In a telegram to the Assistant Secretary of Labor, received on or about March 11, 1974, the President of the United Rubber Workers International Union urged the establishment of an emergency temporary standard for VC. During the hearing of February 15, 1974, the International Union, OSHA, AFL-CIO, and the United Rubber Workers International Union made a joint petition for an emergency temporary standard for VC (2R 141-142), which was also joined by the Oil, Chemical and Atomic Workers International Union (2R 37). At the same hearing, several participants urged, on the other hand, a regular standarding procedure as the most suitable for the orderly development of relevant information (2R 112, 180).

The petition for an emergency temporary standard specified in detail the contents of the standard requested. In substance, the request is to have a comprehensive fully-developed standard based on the recommendations of the Standards Advisory Committee on Carcinogens submitted to the Assistant Secretary of Labor on or about August 27, 1973. The recommendations were forwarding, and cover special aspects of operations, signs and labels, medical surveillance, monitoring, etc., by using a permit system for the use of a carcinogen.

We agree that an emergency temporary standard is necessary, with a ceiling on the basis of the information developed so far that a comprehensive standard such as the one requested is clearly necessary or even desirable. It has been decided to promulgate a standard containing only those essential provisions which are deemed necessary to provide protection to employees from grave danger until a regular rulemaking proceeding in accordance with sections 6 and (e) of the Act can be concluded. The reason for a decision to establish a ceiling value of 50 ppm have already been stated. A decision on other possible, appropriate provisions is best made after consideration of all relevant data and views that interested persons may submit during the proceeding soon to be initiated.

With respect to arguments in opposition to issuance of an emergency temporary standard, the concern and efforts of several companies participating at the hearing for the protection of their employees are recognized. It may also be that some employers in some plants have fully complied with the interim controls recommended by NIOSH on January 30, 1974. There is, however, reason to believe that employees are currently being exposed to VC at concentrations well above 50 ppm. This was asserted several times at the hearing, and not seriously questioned. Moreover, a report, dated March 1974, of a survey by the staff of the Office of Standards Development, OSHA, of several facilities manufacturing VC and polyvinyl chloride revealed concentrations for some job classifications as high as 229 ppm. Therefore, a regulation is considered necessary to provide, immediately, adequate protection to workers ex-

posed to VC. Also, the eight-hour, time-weighted average standard must be based on several parameters, not the highest level, for instance, 100 ppm, has been suggested. The March 1973 report of the study revealed that several kinds of work or operations are of similar duration, frequency or intensity of exposure and may require approximately 15 minutes. The clearing of a reactor may require approximately half an hour. An eight-hour, time-weighted average standard would permit exposure to VC at concentrations of 160 ppm for one hour. Such exposed exposures, several times, if a special test, must not be permitted to occur.

4. The standard, set out below, contains only the minimums deemed necessary to provide protection before the completion of the relevant process going to maximum efficiency.

Because exposure to VC is hazardous, and because such exposure may occur in the process of manufacturing or processing of VC or in the handling of VC polymers or copolymers which contain absorbed VC, the standard applies to all such processes and to the handling, packing, manufacturing, processing, re-labeling, reworking or reconditioning of such these materials. The following requirements serve the purpose, to further, to operate a complete system and to check the effectiveness of the process. Also, engineering controls are favored for consideration, and respirators are intended to provide protection until such controls can be installed or in cases where such controls are not feasible.

As required by section 6(c) of the Federal Act, on the basis of the record of the hearing of February 14, 1974, with exhibits, the written statements received before the hearing pursuant to the notice of the hearing, the post-hearing written submission, by the participants at the hearing, the March 1973 report of a fact-finding survey recommendations received from NIOSH, and the other data referred to herein, it is found (1) that VC at concentrations in excess of 50 ppm is physically harmful and carcinogenic; (2) that exposure to VC at concentrations in excess of a concentration of 50 ppm poses a grave danger to employees; (3) that employees are presently exposed to VC at concentrations in excess of 50 ppm; and (4) that the emergency temporary standard set out below is necessary to provide immediate protection to employees from such danger.

Pursuant to section 6(c) of the Occupational Safety and Health Act of 1970, a proceeding will commence shortly in accordance with section 6(b) of the Act, in which the emergency temporary standard will serve as a proposed rule, together with other subsidiary rules. As soon as possible a draft environmental impact statement will be filed with the President's Council on Environmental Quality, and copies will be provided to other appropriate Federal agencies for their comments.

Pursuant to sections 6(c) and 8(c) (3) of the Williams-Steiger Occupational Safety and Health Act of 1970 (81 Stat. 1595, 1599; (29 U.S.C. 655, 657)), and

Section 1 of Labor's Order No. 12-71 (36 FR 12147), the Code of Federal Regulations is amended by adding a new § 1910.93a to read as follows: (a) Section 1910.93a, added by the Act (42 Stat. 1235; 29 U.S.C. 655), the standard in the new § 1910.93a is determined to be more effective than the corresponding standard now in part 1910 of Title 29, Code of Federal Regulations, and in that part of title 41 of the Code of Federal Regulations. Therefore, the corresponding standard shall be determined by the new standard in § 1910.93a.

1. In 29 CFR Part 1910, § 1910.93 is amended by adding a new § 1910.93a to read as follows: (a) Vinyl chloride.

2. Part 1910 of Title 29 of the Code of Federal Regulations is amended by adding there a new § 1910.93a to read as follows:

§ 1910.93a Vinyl chloride.

(a) Scope and application. (1) This section applies to any area or operation in which vinyl chloride (chloroethene, Chemical Abstracts Service Registry Number 7448, is manufactured, reacted, handled, processed, released, repacked, or stored.

(2) This section does not apply to the handling, storage, or other use of vinyl chloride polymers and copolymers in the form of fabricated products.

(b) Permissible exposure. The occupational environment shall be controlled so that no employee is exposed to vinyl chloride at a concentration in excess of 50 parts per million (ppm) (127.0 mg/cu m).

(c) Monitoring—(1) Initial monitoring. As soon as possible but not later than April 23, 1974, every employer of an employee working in an area or operation in which vinyl chloride is manufactured, reacted, handled, processed, released, repacked, or stored shall begin monitoring the ambient air of the area to determine whether it contains vinyl chloride in concentrations in excess of 50 ppm.

(2) Protective Monitoring of a sufficient number of employees so that a representative sample of exposures to vinyl chloride may be determined shall be accomplished not less frequently than weekly until all results for three consecutive weeks are at or below 50 ppm. Thereafter, monitoring shall be conducted not less frequently than monthly so long as the concentrations of vinyl chloride do not exceed 50 ppm. If a monitoring sample reveals vinyl chloride in concentrations in excess of 50 ppm, weekly monitoring shall be resumed until all results for three consecutive weeks are at or below 50 ppm.

(3) Method of monitoring. Personnel monitoring shall be accomplished by collecting samples by suitable devices worn by the employee. The samples shall be analyzed by gas chromatography or by any other method which is of equivalent sensitivity. The analytical procedure shall be sensitive to 5 ppm of vinyl chloride in air with an accuracy of +20 percent for a ten minute air sample.

(4) Employee observation of workplace. Employees working in any area or operation where ambient air is known to contain, or there is the potential for, a known or suspected carcinogenic substance shall wear the personnel monitoring device as required.

(5) Record-keeping. The results of all monitoring shall be recorded in a permanent record which shall be retained for at least 5 years and shall be made available for inspection and copying by request to the Director of the Administration for Occupational Safety and Health and the Director of the National Institute for Occupational Safety and Health.

(6) Employee exposure. Each employee and employer shall maintain such records of the results of monitoring as required by this section and shall make such exposure records available to the Director of the National Institute for Occupational Safety and Health.

(7) Employee protection. Each employer shall protect any employee who has been or is being exposed to vinyl chloride in concentrations in excess of 50 ppm, and shall remove the employee from such exposure.

(d) Containment. (1) A worker exposed to vinyl chloride in excess of 50 ppm, or whenever not exposed, such as during the removal or release of vinyl chloride from the equipment or from the material, shall be prevented from further release of the material into the ambient air. All employees exposed to such concentrations shall be withdrawn to a safe area and shall not be permitted to re-enter the work area until they wear either Type C continuous flow or pressure demand air supplied respirators or self-contained breathing apparatus.

(2) Work which may reasonably be expected to release vinyl chloride in concentrations in excess of 50 ppm, such as repair, maintenance or cleaning of reactors or other equipment containing vinyl chloride, shall be accomplished only by employees wearing type C continuous flow or pressure demand air supplied respirators or self-contained breathing apparatus.

(3) In any case covered by paragraphs (d) (1) or (d) (2) of this section, in addition to providing the required respirators, the employer shall examine and analyze the source of the excessive concentrations of vinyl chloride in order to determine feasible engineering or operational controls necessary to reduce the airborne concentrations to the permissible level. Such controls shall be implemented as quickly as possible.

(4) Periodic tests shall be conducted for equipment leaks and for conditions of vinyl chloride which may result from work practices.

3. In 29 CFR Part 1910, § 1910.19 is revised to read as follows:

§ 1910.19 Special provisions for air contaminants.

(a) Asbestos dust. Section 1910.53a shall apply to the exposure of every employee to asbestos dust in every employment and place of employment covered by § 1910.12, § 1910.13, § 1910.14, § 1910.15, or § 1910.16, in lieu of any dif-

ferent standard on exposure to radiations which would otherwise be applicable by virtue of any of those sections.

(b) *Vinyl chloride*. Section 1910.126 shall apply to the exposure of every employee to vinyl chloride in every employment and place of employment covered by § 1910.12, § 1910.13, § 1910.14, § 1910.15, or § 1910.16, in lieu of any other standard on exposure to vinyl chloride which would otherwise be applicable by virtue of any of those sections.

Effective date. These amendments shall become effective on April 5, 1974 (Secs. 4, 6, and 8, 81 Stat. 1967, 1969, 1970, 19 U.S.C. 222, 224, 225; Secretary of Labor's Order No. 12-71, 36 FR 2354).

Signed at Washington, D.C., the 23 day of April 1974.

John Stansbury,
Assistant Secretary of Labor.

[FR Doc. 74-10580 Filed 4-4-74; 2:45 am]

File 224—National Defense, Appendix
CHAPTER X—OIL AND GAS,
DEPARTMENT OF THE INTERIOR
[Oil Import Reg. 1 (Rev. 5), Amend. 65]
OIL IMPORT REG. 1—OIL IMPORT
REGULATIONS
Canadian Imports

There appeared in the Federal Register on February 11, 1974 (29 FR 3570) a proposal to amend several sections of Oil Import Regulation 1 (Rev. 5) as amended. Amendment 61 to Oil Import Regulation 1 (Revision 5) made the changes relative to the proposed rulemaking for all sections except for sections 29 and 33, both of which pertain to Canadian imports. Publication of amendment of sections 29 and 33 was deferred until discussions could be held with the Canadian government to determine their export policy. These discussions have been concluded. The Canadian government plans to continue to control exports along the lines of their present controls for at least through September 1974 at which time the method of control may be modified significantly. Accordingly, interested parties should note that, although sections 29 and 33 are written to provide allocations for the entire allocation period May 1, 1974 through April 30, 1975, licenses will only be issued initially for one half of the May 1, 1974 through April 30, 1975 allocation period and the licenses will only be valid for a six month period unless extended by the Director. This procedure will provide for needed flexibility should the Canadian export policy change to the extent that it is necessary to further modify the affected sections of the Oil Import Regulation to conform to such changes.

As stated in the preamble to Amendment 61 the three tier system proposed for ranking allocations under section 29 did not receive complete acceptance. Also, the proposed change to section 29 was predicated on a continuation of the

Federal mandatory crude allocation program in its present form. The Federal Energy Office has now proposed changes to that program. For these reasons it has been decided to put in the Federal Register for ranking allocations of Canadian imports into Districts I-IV. This major change is a provision that requires that a person having an allocation of Canadian imports must process the entire volume of Canadian imports in his own facility.

The changes to section 23 are strictly technical in nature with the exception of the heading which is referred to above.

This amendment also amends section 3 to provide that the total consumption of Canadian imports by any licensee under a license issued pursuant to these regulations may be issued until the end of May 15, following the end of the allocation period in which the licensee was issued. This interim date was added because the Director needs time to prevent disruption of pipeline operations at the end of each allocation period.

This amendment 65 becomes effective on April 5, 1974.

William A. Vetter,
Acting Deputy Assistant
Secretary of the Interior.

Approved:

William E. Simon,
Deputy Secretary of the Treasury.

A new paragraph (f) is added to section 3 to read as follows:

Sec. 3. Allocation periods.

(f) Notwithstanding the provisions of paragraphs (a) and (c) of this section

Sum of each eligible applicant's allocation of Canadian imports in 1973 pursuant to section 23 and section 21-expressed in barrels per day

Sum of all allocations of Canadian imports in 1973 pursuant to section 23 and section 21-expressed in barrels per day

entitles for consideration of Canadian imports by pipeline may be made under the final of May 15 following expiration of the allocation period in which a licensee authorizing such imports from Canada was issued.

Section 29 is amended in its entirety to read as follows:

Sec. 29. Canadian Imports—Districts I-IV.

(a) As used in this section, the term "Canadian imports" means imports from Canada of crude oils which have been produced in Canada and unfinished oils which have been refined from crude oil or natural gas produced in Canada and which have been transported into the United States by pipeline and received at a refinery or other processing facility.

(b) To be eligible for an allocation of imports under this section a person must have in his facility a facility capable of processing such imports.

(c) The Director shall, in accordance with the terms of the present section of this section, make allocations for the allocation period May 1, 1974 through April 30, 1975 of not to exceed 75,000 barrels per day of Canadian imports into District I-IV.

(d) (1) The Director shall make allocations not subject to license rules of Canadian imports to eligible persons who receive a license of such imports for the period May 1, 1974 through December 31, 1974 pursuant to section 23 or from the Oil Import Allocation Board under section 21, if from both. If from such applicant shall be entitled to an allocation of Canadian imports calculated in accordance with the following formula:

X 752,000 barrels/day

or unfinished oil received in his own facilities. Settlements, credits, monetary, or accounting adjustments reflecting the relative values of the oils involved in the exchange are permissible.

(2) Canadian imports which are sold to meet the requirements of regulations published by the Federal Energy Office shall not be subject to the provisions of paragraph (c) of this section.

(f) If a person who receives an allocation of Canadian imports under this section fails to import the total quantity of imports specified in the allocation, or if he fails to process all such imports for Canadian imports received in exchange for such imports in his facilities before July 1, 1975, or if he fails to meet the requirement of paragraph (c) of this section, then any allocation of Canadian imports for Districts I-IV to which such person may otherwise be entitled for the first allocation period beginning after April 30, 1975 shall be reduced by the Director by the amount of Canadian im-

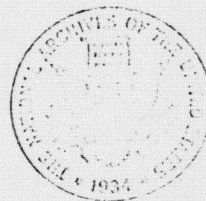
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FRIDAY, OCTOBER 4, 1974

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PART II



DEPARTMENT OF LABOR

Occupational Safety And
Health Administration

12

EXPOSURE TO VINYL CHLORIDE

Occupational Safety and
Health Standards

BEST COPY AVAILABLE

Title 29—Labor

CHAPTER XVII—OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, DEPARTMENT OF LABOR

PART 1910—OCCUPATIONAL SAFETY AND HEALTH STANDARDS

Standard for Exposure to Vinyl Chloride

Pursuant to sections 6(b), 6(c), and 8(c) of the Occupational Safety and Health Act of 1970 (81 Stat. 1361, 1366, 1369; 29 U.S.C. 655, 657), Secretary of Labor's Order No. 12-71 (22 FR 2155) and 29 CFR Part 1911, 1916.92 of 1971 of Title 29, Code of Federal Regulations is hereby amended in the manner set forth below, in order to provide for Occupational Safety and Health standards dealing with the exposure of employees to vinyl chloride.

1. *Background.* (1) Vinyl chloride, vinyl chloride tetramer, and vinyl chloride benzene copolymer are synthetic or semi-synthetic organic chemical compounds which are produced by a variety of processes. It is the primary compound of a family of thermoplastic resin polymers and copolymers which are widely used for construction, wire and film, electrical insulation, pipe, coating, and a variety of other industrial and consumer products. Vinyl chloride has been made commercially in this country since 1939, and present production is in excess of seven million pounds per year. The vinyl chloride industry divides into three segments: monomer production, polymer production, and fabrication. Production of the monomer is a large-scale continuous process, involving only a few firms. There are comparatively few employees in this segment of the industry, because the processes lend themselves to automation.

Vinyl chloride (VC) is used primarily in the production of polyvinyl chloride (PVC), a resin which is produced through batch processing. The conversion of the VC monomer into a polymer or copolymer is an incomplete process, i.e., not all of the monomer is converted.

PVC is fabricated by a variety of techniques, including extrusion, injection molding and calendering, to form a finished product that needs no further chemical handling. The vast majority of employees involved in the VC industry are employed by fabrication firms; these firms range in size from those with few employees and simple equipment to large plants involving many employees and considerable capital.

Vinyl chloride (VC), a gas at ambient temperature and pressure, is a chlorinated hydrocarbon, which heretofore has been regarded as having moderate liver toxicity. The initial standard, contained in Table G-1 of 1910.95, established a ceiling value of 500 parts of VC per million parts of air.

(2) *The emergency temporary standard.* On January 22, 1974, the Occupational Safety and Health Administration (OSHA) was informed by the National Institute for Occupational Safety and Health (NIOSH) that the B. F. Goodrich Chemical Company had reported that deaths of several of its em-

ployees from a rare liver cancer (angiosarcoma) may have been occupationally related. As a result of this notification and after consultation with NIOSH, and a joint inspection of the B. F. Goodrich plant by OSHA, NIOSH, and the Kentucky Department of Labor, a temporary hearing was announced on January 29, 1974 (29 FR 2419) and held on February 12, 1974.

Information obtained from this hearing, particularly the preliminary report of cancer data conducted by Professor George Nathaniel of the University of Cincinnati, Cincinnati, Ohio, demonstrated that employees in the B. F. Goodrich plant in a risk level as low as 10 ppm, and in other plants at higher levels. These reports, presented at the hearing, were preliminary and not conclusive. That OSHA's emergency temporary standard of 500 ppm and 100 ppm for the ceiling value was based on the information available at that time, and that the standard was based on the best available information at that time, and that the standard was based on the best available information at that time.

In past hearings concerning vinyl chloride, OSHA has been informed by various workers who had been exposed to VC in their work. These workers, including those employed by the B. F. Goodrich Chemical Company, have reported that they had experienced health problems, including liver cancer, which they attributed to their exposure to VC.

On the basis of all information available at that time, and the fact that employees were being exposed to levels above the emergency standard, OSHA issued a temporary standard of 100 ppm for the ceiling value, and 10 ppm for the average value, effective April 5, 1974 (39 FR 12749). Pursuant to section 6(c) of the Act, on 22 Oct. 1974.

This standard reduced the permissible exposure level from a ceiling of 500 ppm to a 50 ppm ceiling, and a revised other requirements, including, for example, monitoring and respiratory protection. It was especially recognized that this standard limiting exposure to a 50 ppm ceiling was a tentative, interim standard, and that the whole question of exposure to VC would be considered more fully in the light of additional information, especially the results of experiments which were known to be underway at that time.

On April 15, 1974, information and data were presented to representatives of OSHA, NIOSH, and the Environmental Protection Agency by the Industrial Hygiene Laboratories, Northbrook, Illinois, concerning results of animal exposure studies with VC. These studies were sponsored by the Manufacturing Chemists Association. Although only preliminary in nature at that time, these results revealed that 2 out of 200 mice exposed to VC concentrations of 50 ppm for 7 hours a day, five days a week, for approximately 7 months, had developed angiosarcoma of the liver.

(3) *The proposed permanent standard.* Based on the demonstrated evidence of VC's carcinogenicity in three animal species (rats, mice and hamsters), and the substantial probability that VC had been the causative agent in the case of liver angiosarcoma found in workers both here

and abroad, OSHA proposed to revise the standard and a comprehensive support (29 FR 1676) on May 19, 1974, to protect employees from the risk of cancer to VC. The proposal called for a reduction of employee exposure to VC to a "level of 10 ppm" as measured by a sampling and analytical method. The new standard was an average of 1 ppm to 10 ppm. The proposal also called for the establishment of a ceiling value of 10 ppm for such areas as enclosed spaces. A requirement for employers to provide employees with personal protective equipment to be worn in areas where the level of VC is above the standard was also included.

The proposed standard was based on the information available at that time, and the fact that employees were being exposed to levels above the emergency standard. It was especially recognized that this standard limiting exposure to a 10 ppm ceiling was a tentative, interim standard, and that the whole question of exposure to VC would be considered more fully in the light of additional information, especially the results of experiments which were known to be underway at that time.

In addition, the proposed standard called for a reduction of employee exposure to VC to a "level of 10 ppm" as measured by a sampling and analytical method. The new standard was an average of 1 ppm to 10 ppm. The proposal also called for the establishment of a ceiling value of 10 ppm for such areas as enclosed spaces. A requirement for employers to provide employees with personal protective equipment to be worn in areas where the level of VC is above the standard was also included.

The proposed standard was based on the information available at that time, and the fact that employees were being exposed to levels above the emergency standard. It was especially recognized that this standard limiting exposure to a 10 ppm ceiling was a tentative, interim standard, and that the whole question of exposure to VC would be considered more fully in the light of additional information, especially the results of experiments which were known to be underway at that time.

(4) *Review of the proposal.* The proposal was published on May 19, 1974, and was subject to a 60-day comment period. During this period, OSHA received numerous comments and suggestions from interested parties. On July 25, 1974, a notice of a hearing was published (39 FR 12749), stating a hearing date of July 25, 1974. The hearing was conducted from June 25 through June 26, and again from July 4 through July 15, before Administrative Law Judge Gordon J. Myatt. All participants were given the opportunity to present testimony and to cross-examine other witnesses. Persons participating in the hearing were given until August 23, 1974, to file additional posthearing comments, including various items of information which were requested during the examination of witnesses.

(5) *Economic and technical impact study.* During the hearing, OSHA determined that additional facts would be needed to determine the practicality of certain aspects of the proposed standard. Accordingly, OSHA contacted an independent consultant, Foster D. Snell Corporation, to conduct studies of the feasibility of compliance at various exposure levels, including those proposed by OSHA and others advanced by industry participants. Snell was also commissioned to collect information regarding the economic costs of compliance. The action was announced at the close of the hearing, and Judge Myatt further announced that the record would be kept

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open for a period of three beyond August 23, to allow interested persons to comment in writing on the draft. On August 26, 1974, OSHA announced that the preliminary study was available and that comments were to be submitted no later than September 6, 1974 (29 FR 24341). On September 13, 1974, OSHA invited comments on both the preliminary and the final study, which was to be received on or before September 23, 1974 (29 FR 23699).

(6) *Environmental impact statement.* A notice of intent to file an environmental impact statement assessing the impact of a proposed standard on occupational exposure to VC was published in the *Federal Register* on April 23, 1974 (39 FR 14522). The notice invited any person having information or data on the environmental impact to submit it to OSHA by May 14, 1974. On June 12, 1974, a draft environmental impact statement was prepared and circulated to all interested persons. Two copies were forwarded to the Council of Environmental Quality (CEQ), which published a notice of its filing and availability in the *Federal Register* on June 15, 1974 (29 FR 24475). A 45-day period was allowed for the submission of comments on the draft statement. On September 5, 1974, the final environmental impact statement was prepared and a copy of it and all substantive comments were sent to appropriate governmental agencies, private organizations, and other interested persons. CEQ published a notice of availability for the final statement on September 5, 1974 (29 FR 24500). The submission of comment was invited until September 25, 1974. The final statement and all substantive comments have been carefully considered in arriving at the final standard on occupational exposure to VC.

(7) *The record.* The record in this proceeding is one of the most exhaustive ever relied upon by OSHA. It consists of pre and post-hearing comments and testimony received at both factfinding and rulemaking hearings, the studies and inspections conducted by OSHA personnel, the environmental impact statements, the economic and technical impact studies, and all other relevant information. In all, over 630 written comments have been received, with more than 200 separate oral and written submissions made with regard to the two hearings. The record itself exceeds 4,000 pages. Employers, employees, labor unions, public health groups, independent experts, physicians, research scientists, and specialists in many fields have been invited to submit information and have made their views, knowledge and experience available to OSHA. The entire record encompassing these submissions was thoroughly reviewed and evaluated in reaching the determinations set forth below.

II. *Findings regarding carcinogenicity, exposure levels and feasibility.*—(1) *Carcinogenicity of vinyl chloride.* The carcinogenicity of vinyl chloride for three animal species (rat, mouse, hamster) has been documented on the record by the

studies of Maltoni and Bio-Test Laboratories. Moreover, Maltoni's investigations have demonstrated a dose-dependent relationship for induction of tumors (i.e., more tumors occur at higher exposure levels), including angiosarcoma of the liver, in rats. The investigations of Industrial Bio-Test Laboratories have demonstrated a similar relationship for both rats and mice. These investigators have induced angiosarcoma of the liver in rats and mice at exposure concentrations of 50 ppm, and in hamsters at higher concentrations of exposure. Although tumors involving other organs, including the kidneys, lungs, and skin of exposed animals, were also observed in frequencies much in excess of control animals, the incidence of tumors in mice in the Industrial Bio-Test Laboratories investigations is particularly prominent. Of 264 mice (109 males, 155 females) exposed to 50 ppm of vinyl chloride by inhalation for eleven months, 11 died. Six of the animals died without gross pathology in pathologic examination being performed. Of the 15 remaining animals for which a gross post-mortem pathologic examination was performed, 13 (86 percent) were found with liver tumors (eight angiosarcomas), 21 (64 percent) with lung tumors, 5 (35 percent) with skin tumors, and one with a kidney tumor.

According to the 1970 report by the Surgeon General's Ad-Hoc Committee on the Evaluation of Low Levels of Environmental Chemical Carcinogens, the "induction of cancer in two or more animal species may be extrapolated to indicate a carcinogenic hazard to humans. Here, such a finding was made in three species that were exposed to VC by inhalation—a route comparable to employee exposure. In addition, there were at least 13 confirmed cases of angiosarcoma of the liver among employees exposed to VC, a particularly significant number in view of the extreme rarity of this cancer in the U.S. adult male population (testimony of Dr. Marcus Key, Director of NIOSH, at the rulemaking hearing).

The findings of angiosarcoma of the liver in both experimental animals and exposed employees is compelling evidence that exposure of humans to vinyl chloride induces this tumor. Industry spokesmen, at the hearing, conceded that VC is carcinogenic for humans (e.g., testimony of Dr. McBurney, Rulemaking hearing, 1041). Accordingly, it is concluded that VC must be regarded as a human carcinogen, and the probable causal agent of angiosarcoma of the liver, and that exposure of employees to VC must be controlled.

Additional evidence of tumor induction in a variety of other organs, including lung, kidney, brain and skin, as well as non-malignant alterations, such as fibrosis and connective tissue deterioration, indicates additional oncogenic and toxicologic properties of vinyl chloride, which must be considered in establishing control regulations. (See testimony and results of studies by Bio-Test Laboratories, Tabershaw-Cooper, Maltoni, NIOSH, and Sehtoff.)

(2) *Exposure limits.* Upon finding that exposure of employees to vinyl chloride

may create a carcinogenic hazard, the amount of exposure which is hazardous must be determined. The Surgeon General's Ad-Hoc Committee referred to all the concluded and safe exposure levels for carcinogenic substances could be scientifically determined. This position is supported by the testimony of Maltoni at the hearing. Its recommendation for a standard of no detectable level, and by the testimony of expert witnesses from the National Cancer Institute.

Several written and verbal, oral and written comments have been received by OSHA and have supported the standard of no detectable level. Comments submitted by vinyl chloride workers that exposure of animals, the effects of which they have applied to their own workers sensitive as rodents, on "early onset of cancer" resulted from VC exposures should have already been considered among employees. Some comments that the employees' health records are in effect the only way to have controlled employment, experience as possible before or after exposure to VC, are already covered by the OSHA standard. In view of the fact that vinyl chloride has been used in the workplace for many years, it is not likely that any workers currently exposed in the workplace have not had sufficient exposure to cause cancer. We reject this argument.

The fact that approximately two-thirds of these employees have the highest exposure to VC (over 100 ppm) 10 years since their exposure was not yet been located, makes it very hard to determine the actual number of affected employees. The fact of induction observed to date since exposure was not yet located, since initial exposure to approximately 20 years, is a strong indication of angiosarcoma of the liver-related phenomenon, and if employees engaged in cleaning reactors did not receive larger doses of vinyl chloride, it would be expected that such tumors would be observed earlier for this employee population. For this reason, the significance of presumed lower doses cannot be accurately assessed until a longer period of time has passed, as a longer induction period would be expected.

Initiation of exposure to chemical carcinogens and induction of cancer are not necessarily synchronous events. Because of the physiologic complexities involved with carcinogenesis, induction of tumors does not occur in all employees with similar exposure histories. For example, Dr. Schneiderman of the National Cancer Institute emphasized during his testimony that only about a fifth of longer-term heavy smokers develop lung cancer. Accordingly, the industry contention that exposure levels have been dramatically reduced since the 1940's is not reliable evidence that current levels of exposure are safe.

Some industry spokesmen also suggested that the apparent nonrandom distribution of observed cancer in employees may indicate an exposure threshold for tumor induction, based on variations in the workplace design or practice and resultant employee exposure,

testimony and questioning by Tenneco Chemicals, Inc.). It has also been emphasized that in only 2 of 8 polymerization plants where employees have been exposed to VC for more than 20 years have any employees developed angiosarcoma of the liver. This argument is very similar to that raised concerning reliability of past employee exposure. Although historical and epidemiological differences may ultimately be demonstrated to be factors in distribution of angiosarcoma, sufficient information is unavailable to exclude from consideration of risk those employees in workplaces for which cases of angiosarcoma have not been observed.

It has also been suggested that the absence of cancer in a population of 235 Dow Chemical Company polymerization employees, monitored over a period of 7 years, indicates that exposure to vinyl chloride at concentrations of less than 200 ppm is safe. (See study by Dr. Cook, submitted at the hearing by Dow Chemical Company.) However, the group surveyed did not include 19 workers who had been exposed, and the missing employees included many who had the longer term (over 20 years) exposures. Moreover, the statistically insignificant size of the sample population decreases the possibility that tumors would be observed.

Dow also presented preliminary data in testimony at the hearing on the possible metabolic pathways of VC. The hypothesis presented was that VC may exert its carcinogenic effect by a metabolite, and that the metabolite is produced only when VC is metabolized by a secondary metabolic pathway operating only when enzymes regulating the primary pathway are saturated, as would be the result at higher exposures. The preliminary data indicated the possibility of an additional pathway for metabolism of VC in rats exposed to concentrations of VC in excess of 220 ppm. However, the occurrence of angiosarcoma in both rats and mice at VC exposure concentrations of 50 ppm indicates that if a metabolite of VC is the ultimate carcinogen, then it must be generated at lower exposure concentrations in these species. Although this research may be helpful to the thorough understanding of the carcinogenicity of VC, it appears that it does not yet offer evidence which can assist in determination of safe exposure concentrations for employees, or even that such safe exposures exist.

A number of witnesses representing employers have stressed that there is no evidence of cancer, either in employees or experimental animals, at exposure concentrations of VC less than 50 ppm. (See e.g., testimony of Firestone, Tenneco Chemicals.) The conclusion of these witnesses was that no decision can be made concerning risk of exposure to VC at concentrations less than 50 ppm.

On the other hand, the testimony of most expert witnesses, including some industry biomedical experts, stated that quantification of a safe exposure concentration is not possible with the present state of scientific knowledge. (See

e.g., testimony of Solkoff, Firestone, NCI, and NIOSH.)

In our view, the demonstration of cancer induction in humans at a particular level is not representative of determination that a substance represents a cancer hazard for humans at that level. It would be imprudent to require men to be hypersensitive to VC exposure than experimental animals in the absence of conclusive evidence. It would also be unfounded to assume that animals will not develop tumors when exposed at concentrations of VC of less than 50 ppm. Should a sufficiently large number of experimental animals be exposed to VC at concentrations of less than 50 ppm, Solkoff would add that it would be expected that some would develop VC-induced tumors.

(3) *Feasibility.* There is virtually no dispute that most, if not all, fabricators are currently capable of reaching exposure levels of 1 ppm through engineering controls. These employers employ well over 50 percent of all employees exposed to VC. Indeed, several fabricators are already operating at this level (see EPA testimony). However, industry spokesmen have universally claimed that it is infeasible for the VC and PVC industries to remain below 1 ppm consistently, using engineering controls. In addition, the Shell study on technical feasibility concluded that a 1 ppm ceiling is not feasible for the VC and PVC industries with present technology, but that the VC industry could currently attain lower exposure levels than the PVC industry. Labor union spokesmen and the Health Research Group, Inc., however, have suggested that such a level is attainable.

Since there is no actual evidence that any of the VC or PVC manufacturers have already attained a 1 ppm level or in fact instituted all available engineering and work practice controls, any estimate as to the lowest feasible level attainable must necessarily involve subjective judgment. Likewise, the projections of industry, labor, and others concerning feasibility are essentially conjectural. Indeed, as Firestone has suggested, it is not possible to accurately predict the degree of improvement to be obtained from engineering changes until such changes are actually implemented.

We agree that the PVC and VC establishments will not be able to attain a 1 ppm TWA level for all job classifications in the near future. We do believe, however, that they will, in time, be able to attain levels of 1 ppm TWA for most job classifications most of the time. It is apparent that reaching such levels may require some new technology and work practices. It may also be necessary to utilize technology presently used in other industries. In any event, the VC and PVC industries have already made great strides in reducing exposure levels. (See testimony of Dow Chemical Co., TR 972). For example, B. F. Goodrich testified (TR 1170) that it has reduced average exposure levels in several PVC plants from 35-40 ppm early this year to 12-13 ppm at the time of the hearing. We are

confident that industry will continue to do so.

(4) *Correlations.* The conclusions below are based on a thorough review and evaluation of all the evidence submitted. Where decisions can be based on record evidence, this has been done. Where, however, factual correlations are lacking or where the facts do not provide an answer, policy judgments have been made.

There is little dispute that VC is carcinogenic to man and we so conclude. However, the precise level of exposure which poses a hazard and the question of whether a "safe" exposure level exists, cannot be definitively answered on the record. Nor is it clear to what extent exposures can be reasonably reduced. We cannot wait until further research is able to answer these questions. In the interim, we have had to choose our best judgment on the basis of the best available evidence. These judgments have involved a balancing process, in which the overriding consideration has been the protection of employees, even those who may have regular exposures to VC throughout their working lives.

Based on the available evidence and in view of the above considerations, including feasibility, we believe that employee exposures to VC must be reduced to a 1 ppm time-weighted average (TWA). We also believe that VC and PVC establishments, in time, be able to attain that level through engineering controls and that fabricators can do so in the immediate future.

In addition to the TWA requirement, we have established a 5 ppm ceiling (averaged over a 15-minute period) in order to prevent exposure of employees to unacceptable high excursions. From an operation standpoint, this ceiling level is realistic because minor excursions up to the ceiling level are likely to occur on a regular basis.

III. *The final standard.*—(1) *Scope and application.* Both the TWA and the proposal would apply the standard to the entire VC industry, including manufacturers of VC and PVC and fabricators, but excluding employers handling or using fabricated products made from VC.

There is no dispute that a standard is required for the monomer and polymer industries. However, the Society of Plastics Industry (SPI) and various fabricators (see testimony of Goodrich, General Cable, etc.) recommended that fabricators be excluded from the standard, or that a separate requirement be established for them because many of them were already at or below the proposed ceiling level.

The record evidence establishes that at least some employees in the fabricating industry are exposed in excess of the permissible control limits. (See NIOSH testimony, TR 106; Rohntech TR 629). In these circumstances, we believe that it is imprudent to grant a blanket exemption for all fabricators. Therefore, the final standard is applicable to the fabricating industry, as well as the monomer

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and polymer industries. Employers who, in fact, are substantially below the exposure limit will be subjected to only minimal burdens by virtue of the "action level" to be discussed below.

Where employers in the fabricating industry have exposures approaching the permissible limit, they will appropriately be subject to the standard. Employers handling or using fabricated products made of PVC were not included in the ETS or the proposal and are excluded from the final standard. This conclusion is based on the absence of adequate evidence of exposure to VC in the operations. The final standard clarifies the exemption by defining a fabricated product as a product made wholly or partly from PVC which does not require further processing at temperatures, and for times, sufficient to cause mass melting of the PVC. SPI and others (cf. T12, 311) requested that PVC resins with less than 0.1 percent residual monomer be exempted from the regulation now, and that the exemption level be reduced to 0.01 percent in three years. SPI suggested that the exemption of materials with less than 0.1 percent of 14 carcinogens from 29 CFR 1810.93p (29 FR 3755) was an appropriate precedent. The cases are not comparable, because no attempt had been made to set air concentration limits for the 14 carcinogens. The record did not include information that reliable monitoring and measuring techniques were available. Moreover, the exemption did not exempt airborne traces of carcinogens. The administrative cut-off was provided to avoid regulation of materials about which there was no health hazard information, and which would have broadly extended the application of the regulation beyond the record. Herein, no information was presented to show safe concentration results from the use of resins with specific levels. Indeed, the proposal to change the level later, when improved technology would permit such reduction, would seem to indicate that SPI has doubts about the safety of 0.1 percent residue level. Diamond Shamrock (Exhibit 149) testified that there is no direct relation. They indicate that the airborne concentration is more related to the physical form of the resin and the ventilation provided. Also, monitoring data from industry (cf. Exhibits 131, 168, 170) and OSHA (Exhibit 151) indicate that levels in excess of 1 ppm may be found in fabrication operations. In view of these facts and of the opportunity for employers to discontinue many duties upon a showing of no exposures above the action level, it does not appear that any residue exemption is either justified or necessary at this time. This course also agrees with a number of industry proposals (cf. T1: 630).

SPI (CFR 345), among others, asked that compounded PVC pellets be exempted from the standard on the grounds that the pellets had too low a residue to cause harmful or measurable emissions. While it appears that PVC pellets would have a lower residue level than virgin PVC, the fact that the pellets must be heated to a molten mass at the same

temperature as PVC, for further processing, indicates that a potential for release of the residue still exists. It appears that the exemption of fabricated products should be limited to just those items which will not undergo such mass heating. Further, the opportunity to demonstrate that exposures are below the action level, and thus, discontinue many duties of the standard, provides a more positive control and an adequate relief.

(2) *Permissible exposure limit.* The standard sets an exposure limit of 1 ppm averaged over any 8 hour period, and a ceiling of 5 ppm averaged over any period not exceeding 15 minutes.

As more fully discussed above, this limit is based on an evaluation of the best available evidence and on a judgment that the health and safety of employees must be protected to the fullest extent feasible. In view of the fact that release of VC in the VC and PVC manufacturing processes are variable, the 1 ppm ceiling level provided in the proposal would require maintenance of an average level significantly more difficult to attain through feasible engineering controls. Therefore, the exposure limit presented in the proposal has been rejected.

(3) *Action level.* The final standard, unlike the ETS and the proposal, provides for an "action level" of 0.5 ppm TWA, one-half of the permissible exposure limit. The purpose of the action level is to minimize the impact of the standard on the employers who have attained exposure levels well below the permissible limit. Thus, where the results of monitoring under paragraphs (d)(1) or (d)(2) demonstrate that no employee is exposed in excess of 0.5 ppm TWA, employers may, in effect, be exempted from some provisions of the standard. For example, fabricators who are below the action level are not required to provide medical surveillance or to monitor again, unless the employer has reason to suspect that any employee is exposed in excess of the action level. In our judgment, exposures below the action level do not present a sufficient hazard to warrant application of the entire standard to the many employers who are or will be below that level.

(4) *Monitoring.* The final standard, like the proposal, requires that individual employee exposure levels be determined. This may be accomplished by personal or area monitoring. Some witnesses, and persons who submitted comments did not understand the meaning of the term "95 percent confidence level" in the proposal. Essentially it means that the employer is required to take a sufficient number of measurements so that the results obtained are statistically valid. We have modified the proposal to establish accuracy range requirements for various measurement levels. These ranges are narrow enough to ensure that a determination of compliance can be made, and broad enough to allow the application of a variety of technologies.

All covered employers are required to conduct initial monitoring. Where monitoring and measuring results are at or

below the action level, no further monitoring is required unless the employer has reason to suspect that any employee is exposed in excess of the action level, or unless changes have been made in production, process, control, type of resin, etc.

Where the exposure level, without regard to respirators, exceeds the permissible levels, monitoring must be conducted at least monthly. Where exposures are less than the permissible level, but greater than the action level, monitoring must occur at least quarterly.

(5) *Methods of compliance.* The standard, like the proposal, requires that employers immediately institute feasible engineering and work practice controls to reduce exposures to at or below the permissible exposure limit.

Where feasible engineering and work practice controls will reduce exposures below the permissible level, they must be instituted. Where such controls will not reduce exposures below the permissible level, they must nevertheless be implemented to reduce exposures to the lowest practicable level, and be supplemented by the use of respirators to provide the necessary protection. Thereupon, a continuing program of engineering and work practice control must be instituted to reduce exposures to the lowest practicable level. Where exposures are at or below the permissible exposure limit, the program may be discontinued.

In addition, a plan for achieving control by engineering and work practice methods must be developed and be made available, upon request, to representatives of OSHA and NIOSH.

We recognize that many employers covered by the standard are now currently achieving compliance with the permissible exposure limit solely by the use of feasible engineering and work practice controls. The record also reflects broad generic definitions between the compliance capabilities of the VC and PVC industries. Some industry spokesmen, including SPI (CFR 344-346), recommended that a schedule of different permissible exposure limits and compliance dates be established for the VC and PVC segments of the industry.

This view assumes that the ability and the time required to feasibly reach increasingly lower control levels is similar within each industry, but differs markedly between industries. While the record does suggest that such differences do exist between industries, as noted above, it is clear that intra-industry differences also exist. Thus, the ability and time required by each employer to attain lower control levels may depend upon such factors as the climate in which the plant is located, the age of equipment, the size of reactors, or the type of resin manufactured or used. (Such study, Firestone testimony, etc.)

Monitoring data also tends to support such intra-industry variations. (See, e.g., Dow, Firestone, Tenneco.)

As noted above, the standard requires all employers to institute feasible engineering controls to the fullest extent and to continue to improve and apply engi-

nearline controls until full compliance is achieved.

We have not established any deadlines for full compliance through engineering controls, and we are presently unable to determine when it will be feasible for most establishments to reduce exposure levels to the permissible level.

We also believe that the requirement that each employer reduce airborne concentrations to the permissible level or to the lowest level available is practicable will provide for inter-industry and intra-industry technological differences which do exist, and will avoid the setting of separate industry standards on the basis of the general situation and conditions in the community.

(6) *Regulated areas.* The proposed standard would have required that regulated areas be established, that access be limited to authorized employees, and that daily rosters of the members of those entering be kept for at least 28 years. In addition to these requirements, it was asserted that such control of access was not necessary from a health standpoint. Secondly, it was claimed that these controls would interfere with operations by preventing access of needed employees or non-employees, such as contractors, truck drivers, customers and consultants.

The purpose of establishing regulated areas in the proposal was to limit risk of exposure to as few employees as possible. This concern is still pertinent, and thus the limited access feature remains. The final standard raised the proposal slightly to allow "authorized persons" to enter regulated areas. This change, it is felt, will allow them to continue without undue interference. The final standard has also increased the length of time daily resters must be maintained from 20 to 30 years. This change was based largely on epidemiological considerations. (See NIOSH testimony, tr. 119.)

(7) *Respiratory protection.* The final standard, like the proposal, requires the use of respirators where employee exposures exceed the permissible control level. Industry representatives made a number of objections to proposed requirements for respiratory protection. They stated that the "no detectable level" would effectively require continuous wearing of respirators in PVC and VC plants, and that this is not feasible because respirators are cumbersome, present a safety hazard, and employers would not use them.

We would agree that respirators have many drawbacks; the proposal did not contemplate them as a final solution. The record shows that the PVC industry particularly may need several years before plant environmental levels can be reduced so that respirators are necessary only occasionally. However, we cannot agree that respiratory protection should not be required simply because it is inconvenient, may require additional personnel, interferes with production, or may require extensive retraining of employees and restructuring of work practices. We have carefully considered all the objections, and have concluded that

If the environmental level is not controlled to the permitted exposure limit, then employees must be afforded respiratory protection.

While the changes in cases of the per-
missible level on constitute a trend, we
believe that it is necessary to initiate
some of the problems associated with
implementing a program of re-education
protection while employees are being
fitted and trained in residual duty, and
while other adjustments which may be
required are implemented. Therefore,
until January 1, 1976, when measures
are not in place of a 25% pay ceiling,
each employer must monitor each em-
ployee with an appropriate restriction.
However, employers with no resources do
not extend a 25 pay ceiling, and decline
to use the formula, in which case the
employer is not obligated to report em-
ployee. During this adjustment period, em-
ployees will be trained by their super-
visors and limitations or restrictions, and
the hazards of exposure in field of work.
Moreover, each employee will be notified
in writing if he has been exposed in ex-
cess of the permissible exposure limit.

Where exposures exceed 10 ppm ceiling, respiratory protection is mandatory in light of our judgment that much greater risks are associated with such exposures.

The provisions in the final standard regarding the selection and use of respiratory protective devices differ from those in the proposal. These provisions of atmosphere-sampling regulators have been revised to indicate more clearly the types of devices intended and the minimum permissible concentration level for each device. Moreover, the number of types of atmosphere-sampling devices has been increased.

At the hearing Mr. Edwin C. Hyatt, an OSHA consultant, made suggestions regarding the use of portable respiratory devices. We have concluded that his suggestions are meritorious. Therefore, the provisions for selection of atmosphere-supplying devices follow closely the recommendations contained in his testimony of SPI and B. P. Goodrich (TR 85 ff) We had originally omitted air-purifying respirators because none had been approved by NIOSH for use against VC, principally because they lacked indicators to signal the expiration of the service life of the sorbent. Hyatt and other witnesses discussed in detail the desirability of being able to use canisters or cartridge air-purifying respirators, provided a sorbent could be shown to effectively absorb vinyl chloride with an adequate service life. Recently, OSHA has received respiratory data from laboratories regarding the effectiveness of commercially available canisters and cartridges for vinyl chloride. These evaluations were conducted separately by NIOSH and by the B. P. Goodrich Company and submitted to OSHA in post-hearing comments. The results indicate that certain presently available canisters and cartridges effectively absorb vinyl chloride at relatively low concen-

findings. In the case of the 2000 findings with NQX, it has indicated that it is within the competence of an expert, such as the approval of other underlying regulations for any further VOT. On the other hand, it is indicated that the type of air pollution regulation is the list of regulations that, subject to the request of other states, is included in the request of other states. In the case of the 2000 findings, it is indicated that the type of air pollution regulation is the list of regulations that, subject to the request of other states, is included in the request of other states. In the case of the 2000 findings, it is indicated that the type of air pollution regulation is the list of regulations that, subject to the request of other states, is included in the request of other states.

the *Herndon* collection. This is a new collection within the first listed. It encompasses all the physical requirements for maintaining that collection, thus including the related items in terms of personnel, equipment, etc. Only under *Herndon* does the word "and" occur with such open space. The use of the new edition is the subject of a new record in action, that is, the first of exposure to which the film is subjected, the responsibility for the film is placed in the hands of the director, rather than in a conventional high school model as is trapped.

The proposed amendment for full-body, fireproof clothing has been replaced by the direction to use fireproof garments suited to the particular situation and the degree of heat of exposure. Thus, full-body clothing is not always necessary, and is therefore not required where less protection is adequate. Since most entry falls within the definition of a hazardous operation, the very entry section of the proposal has been deleted from the final standard.

(9) *Emergency situations.* The definition of emergency has been recent in terms of an unexpected massive release. The main objection to the notion of emergency situations in the proposal was that, as the term was defined, many ordinary leaks or operations resulting in a small release of vinyl chloride would be considered emergencies. This was not the intent of the proposal. The final standard has been clarified to correct this ambiguity. It should be noted that the written operational plan required by the standard need not be developed for minor excursions above the permissible exposure limit, and that such excursions need not be reported.

(b) *Signs and Labels.* The third of the signs and labels section is to apprise employees of the cancer and fire hazard. No objections have been raised with respect to informing employees of the fire hazard. However, a number of objections were raised at the hearing and in written submissions to the requirement that the word "cancer" appear on all signs and labels. The principal argu-

ment advanced against its use was that the term "cancer" or "cancer-suspect agent" scares employers and that instead, the label should contain instructions on how to deal with the substance (CFR 157D). We believe that a diluted form of warning will not suffice. We appreciate the concern of employers with the reaction of their employees. But we consider it imperative that a worker be fully informed of the risks to his health and the possible risks involved in his occupation. Coupled with the following requirement in the standard, we believe that the signs and labels required will adequately inform employees of the hazard. In addition, such signs will warn employers and personnel to keep out of regulated areas.

The proper selection of most protective measures requires an amount of training and education of employees that cannot easily be conveyed on a sign or label. Also, the variety of measures that could be present would result in an unwieldy or excessively detailed legend. Consequently, the required signs and labels will not include information on precautions, relevant symptoms, etc. The addition of a table of information by the employer would be permitted, providing it does not detract in any way from the required statement.

The requirement in the proposal for labeling containers of vinyl chloride has been amended by deleting the reference to the possible hazard of violent polymerization. Very little information was developed on this hazard during the standard-setting procedure. It does appear that this hazard is essentially under control and that the fire and carcinogenic hazards at present are the most significant. Since labeling or placarding that is in compliance with the U.S. Department of Transportation regulations (49 CFR Part 173, Subpart H) already warns of the fire hazard, only a statement concerning the carcinogenic hazard need be added to the Department of Transportation labels.

(11) *Medical surveillance.* The principal questions that have been raised regarding medical surveillance are the necessity and efficacy of requiring certain specific serum enzyme determinations (SMA-12 series) and the application of medical examination requirements to the fabrication segments of the industry where employees are exposed to lower levels of VC. The objection has also been raised that the specification of tests and procedures interferes with the application of advances in medical knowledge.

A particular difficulty in considering medical surveillance is that the most commonly discussed lesion, angiosarcoma of the liver, currently cannot be diagnosed until the victim is terminal and, usually, within months of death. Precursor physiologic alterations, which might be reversible, have not yet been directly associated with the lesion. Consequently, there are no specific diagnostic tests which can be prescribed which will determine presence or absence of this tumor at an early stage of development. However, most medical witnesses

indicated that the medical tests proposed are currently the only ones available which are useful for monitoring exposure (CFR 151, Mich. 25, 271-280-551). Consequently, the specific blood tests proposed have been retained as a minimum requirement to assist the examining physician in determining the extent of potential exposure for as numerous to workers as involving VC exposure. In addition, alternative medical examinations may be used where the examining physician determines that they are as good as those specified by the standard.

The Federal Occupational Safety and Health Administration concurs in the various general exclusions proposed that VC may produce a wide spectrum of malignant and non-malignant disorders. The general scope of the required medical examination has, therefore, been broadened to include pulmonary, renal, reproductive tissues, lymphatic, and immunologic system, as well as the liver. No additional specific procedures or tests are required, but recommendations have been included in the Appendix to assist the examining physician. Because of the non-specific nature of the required medical tests, it is not appropriate to prescribe a single, or type of followup tests, or to regulate withdrawal from exposure based solely on results of the tests. Instead, the employer is required to obtain a statement from the examining physician of the employee's suitability for continued exposure, when the examining physician has completed such tests as he considers appropriate. The employer is required to withdraw an employee only when this statement indicates that the employee may be at added risk from continued VC exposure.

As with monitoring, there remains to be no basis for complete exemption of the fabrication industry from the requirement for medical examination. The record does show fabricating establishments with concentrations of VC monitored considerably above the action level. In these instances, medical surveillance of affected employees will provide baseline data for future evaluation of their health, even if both monitoring and medical surveillance are discontinued because improved controls reduce concentrations below the action level. Where exposures are below the action level, the medical surveillance requirements do not generally apply.

(12) *Training.* A separate provision for employee training has been added to the final standard rather than including it within the section on emergency situations as in the proposal. The new paragraph provides for training of employees concerning the carcinogenic hazard of VC, emergency procedures, the need for monitoring and an annual review of the standard. It also provides for training of employees concerning the purpose for, proper use of, and limitations connected with respiratory protection.

(13) *Records and reports.* The provisions for recordkeeping contained in the final standard require the preparation and maintenance of essentially the same information required by the proposal. The major change from the original pro-

posal is the requirement for maintenance of monitoring records and daily roster sheets of regulated personnel for 30 years, instead of 20 years. Additionally, the employer is required to maintain medical records for the duration of an employee's employment plus 20 years, or 25 years, whichever is longer. The original proposal called for only 20 years.

This change has been made in order to ensure that the 30-year record retention of a worker's exposure up to 10 years from initial exposure. The retention of information, medical records must be maintained for at least that long. It will be noted that the change for 25 years and higher record retention that this change is made.

The revised requirements are not as difficult to comply with as the original proposal. However, there are the provisions for reporting of results which result in the release of data into the public domain may be increased. The final standard changes the original intent of the proposal that only information must be reported. Also the requirement for filing a completed, written report within 15 days has been deleted. It has been changed to that reports may, within 24 hours, be in initial report. This includes initial and follow-up reports. It would ordinarily be considered, however, if the OSHA Area Director requests further information relevant to the case, the employer will be required to furnish such information.

(14) *Deletion of portions of the proposal.* The proposal contained provisions requiring that lower incidence change rooms be provided and that storage or consumption of food be prohibited in regulated areas. We have deleted these provisions because it is our conclusion they are no longer necessary. Storing facilities are not required because protective clothing, where required by the final standard, should protect employees from skin absorption by direct contact with VC and because there is no reliable evidence that VC vapor is absorbed through the skin. In addition, since we anticipate that most employees will not be wearing protective clothing and that employees who wear protective clothing will change such clothing infrequently, we are not requiring that change rooms be provided.

In addition, we feel that there is inadequate evidence showing that hazardous amounts of VC can be absorbed through ingestion. For this reason, the requirement prohibiting the storage or consumption of food in regulated areas has been deleted.

The proposal also contained provisions on maintenance and decontamination, transportation loading and unloading, and polymer handling operations. These requirements are not mentioned in the final standard because attention to these items is implicit in the requirement that each employer reach the permissible exposure limit or attain the lowest feasible level.

(15) *Effective date.* In order to ensure that affected employers and employees will be informed of the existence of these

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provisions and that employers affected are given an opportunity to familiarize themselves with their employees and the existence of the new requirements, the effective date of the amendment to § 1910.93(a) will be January 1, 1975. To provide continued protection for employees until that date, the provisions currently contained in § 1910.93(a) are hereby promulgated, pursuant to section 6(a), 6(c) and 6(e) of the Occupational Safety and Health Act, as an occupational safety and health standard effective October 1, 1974, the amendments to § 1910.93(a) set out below will become these provisions as of January 1, 1975.

According to your consideration of the whole record on this proceeding, Part 1910 of Title 29, Code of Federal Regulations is amended, effective January 1, 1975, by revision of § 1910.93 to read as follows: § 1910.93g Vinyl chloride.

(a) **Scope and application.** (1) This section includes requirements for the control of employee exposure to vinyl chloride (chloroethene). Chapter 45-Subchapter B Service Registry No. 45015.

(2) This section applies to the manufacture, reaction, packaging, repackaging, storage, handling or use of vinyl chloride or polyvinyl chloride, but does not apply to the handling or use of fabricated products made of polyvinyl chloride.

(3) This section applies to the transportation of vinyl chloride or polyvinyl chloride except to the extent that the Department of Transportation may regulate the hazards covered by this section.

(b) **Definitions.** (1) "Action level" means a concentration of vinyl chloride of 0.5 ppm averaged over an 8-hour work day.

(2) "Assistant Secretary" means the Assistant Secretary of Labor for Occupational Safety and Health, U.S. Department of Labor, or his designee.

(3) "Authorized person" means any person specifically authorized by the employer whose duties require him to enter a regulated area or any person entering such an area as a designated representative of employees for the purpose of exercising an opportunity to observe monitoring and measuring procedures.

(4) "Director" means the Director, National Institute for Occupational Safety and Health, U.S. Department of Health, Education, and Welfare, or his designee.

(5) "Emergency" means any occurrence such as, but not limited to, equipment failure, or operation of a relief device which is likely to, or does, result in massive release of vinyl chloride.

(6) "Fabricated product" means a product made wholly or partly from polyvinyl chloride, and which does not require further processing at temperatures, and for times, sufficient to cause mass melting of the polyvinyl chloride resulting in the release of vinyl chloride.

(7) "Hazardous operation" means any operation, procedure, or activity where a release of either vinyl chloride liquid or gas might be expected as a consequence

of the operation or because of an accident in the operation, which would result in an employee exposure in excess of the permissible exposure limit.

(8) "OSHA Area Director" means the Director for the Constitutional Safety and Health Administration Area Office having jurisdiction over the geographic area in which the employer's establishment is located.

(9) "Polyvinyl chloride" means polyvinyl chloride homopolymer or copolymer where such is converted to a fabricated product.

(10) "Vinyl chloride" means vinyl chloride monomer.

(c) **Permissible exposure limit.** (1) No employee may be exposed to vinyl chloride at concentrations in excess of 1 ppm averaged over an 8-hour work day.

(2) No employee may be exposed to vinyl chloride at concentrations greater than 5 ppm averaged over any period not exceeding 15 minutes.

(3) No employee may be exposed to vinyl chloride by direct contact with liquid vinyl chloride.

(d) **Monitoring.** (1) A program of initial monitoring and measurement shall be undertaken in each establishment to determine if there is any employee exposed, without regard to the use of respirators, in excess of the action level.

(2) Where a determination conducted under paragraph (d)(1) of this section shows any employee exposures, without regard to the use of respirators, in excess of the action level, a program of determining exposures for each such employee shall be established. Such a program:

(i) shall be repeated at least monthly where any employee is exposed, without regard to the use of respirators, in excess of the permissible exposure limit.

(ii) shall be repeated not less than quarterly where any employee is exposed, without regard to the use of respirators, in excess of the action level.

(iii) may be discontinued for any employee only when at least two consecutive monitoring determinations, made not less than 5 working days apart, show exposures for that employee at or below the action level.

(3) Whenever there has been a production, process or control change which may result in an increase in the release of vinyl chloride, or the employer has any other reason to suspect that any employee may be exposed in excess of the action level, a determination of employee exposure under paragraph (d)(1) of this section shall be performed.

(4) The method of monitoring and measurement shall have an accuracy (with a confidence level of 95 percent) of not less than plus or minus 50 percent from 0.25 through 0.5 ppm, plus or minus 25 percent from over 0.5 ppm through 1.0 ppm, and plus or minus 25 percent over 1.0 ppm. (Methods meeting these accuracy requirements are available in the "NIOSH Manual of Analytical Methods").

(5) Employees or their designated representatives shall be afforded reasonable

opportunity to observe the monitoring and measuring required by this paragraph.

(e) **Regulated area.** (1) A regulated area shall be established where:

(i) Vinyl chloride or polyvinyl chloride is manufactured, reacted, repackaged, stored, handled or used; and

(ii) Vinyl chloride concentrations are in excess of the point at which are health.

(2) Access to regulated areas shall be limited to authorized persons. A roster shall be made of authorized persons who enter.

(f) **Methods of compliance.** The above exposures to vinyl chloride shall be determined by air or by other methods of exposure limit provided in accordance with the criteria for determining such a point, and personal protective equipment as follows:

(1) Feasible engineering and work practice controls shall be monitoring be used to reduce exposures to at or below the permissible exposure limit.

(2) Where feasible engineering and work practice controls which can be instituted immediately are not sufficient to reduce exposures to at or below the permissible exposure limit, they shall nevertheless be used to reduce exposures to the lowest feasible level, and shall be supplemented by respiratory protection in accordance with paragraph (g) of this section. A program shall be established and implemented to reduce exposures to at or below the permissible exposure limit, or to the lowest extent feasible, solely by means of engineering and work practice controls, as soon as feasible.

(3) Written plans for such a program shall be developed and forwarded upon request for consultation and approval to authorized representatives of the Assistant Secretary and the Director. Such plans shall be updated at least every six months.

(g) **Respiratory protection.** Where respiratory protection is required under this section:

(1) The employer shall provide a respirator which meets the requirements of this paragraph and shall assure that the employee uses such respirator, except that until December 31, 1975, wearing of respirators shall be at the discretion of each employee for exposures not in excess of 25 ppm, measured over any 15-minute period. Until December 31, 1975, each employee who chooses not to wear an appropriate respirator shall be informed at least quarterly of the hazards of vinyl chloride and the purpose, proper use, and limitations of respiratory devices.

(2) Respirators shall be selected from among those jointly approved by the Mining Enforcement and Safety Administration, Department of the Interior, and the National Institute for Occupational Safety and Health under the provisions of 30 CFR Part 11.

(3) A respiratory protection program meeting the requirements of § 1906.134 shall be established and maintained.

(4) Selection of respirators for vinyl chloride shall be as follows:

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Atmospheric concentration of vinyl chloride	Required apparatus
(i) Unknown, or above 3,000 ppm.....	Open-circuit, self-contained breathing apparatus, pressure demand type, with full facepiece.
(ii) Not over 3,000 ppm.....	(A) Combination type C supplied air respirator, pressure demand type, with full or half facepiece, and auxiliary self-contained air supply; or (B) Type C, supplied air respirator continuous flow type, with full or half facepiece, and auxiliary self-contained air supply.
(iii) Not over 100 ppm.....	(A) Combination type C supplied air respirator demand type, with full facepiece, and auxiliary self-contained air supply; or (B) Open-circuit self-contained breathing apparatus with full facepiece, in demand mode; or (C) Type C supplied air respirator, demand type, with full facepiece.
(iv) Not over 25 ppm.....	(A) A powered air-purifying respirator with hood, helmet, full or half facepiece, and a canister which provides a service life of at least 4 hours for concentrations of vinyl chloride up to 25 ppm; or (B) Gas mask, front- or back-mounted canister which provides a service life of at least 4 hours for concentrations of vinyl chloride up to 10 ppm.
(v) Not over 10 ppm.....	(A) Combination type C supplied air respirator, demand type, with half facepiece, and auxiliary self-contained air supply; or (B) Type C supplied air respirator, demand type, with half facepiece; or (C) Any chemical cartridge respirator with an organic vapor cartridge which provides a service life of at least 1 hour for concentrations of vinyl chloride up to 10 ppm.

(5)(i) Entry into unknown concentrations or concentrations greater than 30,000 ppm (lower explosive limit) may be made only for purposes of life rescue; and

(ii) Entry into concentrations of less than 30,000 ppm, but greater than 3,000 ppm may be made only for purposes of life rescue, firefighting, or securing equipment so as to prevent a greater hazard from release of vinyl chloride.

(6) Where air-purifying respirators are used:

(i) Air-purifying canisters or cartridges shall be replaced prior to the expiration of their service life or the end of the shift in which they are first used, whichever occurs first; and

(ii) A continuous monitoring and alarm system shall be provided where concentrations of vinyl chloride could reasonably exceed the allowable concentrations for the devices in use. Such system shall be used to alert employees when vinyl chloride concentrations exceed the allowable concentrations for the devices in use.

(7) Apparatus prescribed for higher concentrations may be used for any lower concentration.

(h) **Hazardous operations.** (1) Employees engaged in hazardous operations, including entry of vessels to clean polyvinyl chloride residue from vessel walls, shall be provided and required to wear and use:

(i) Respiratory protection in accordance with paragraphs (c) and (g) of this section; and

(ii) Protective garments to prevent skin contact with liquid vinyl chloride or with polyvinyl chloride residue from vessel walls. The protective garments shall be selected for the operation and its possible exposure conditions.

(2) Protective garments shall be provided clean and dry for each use.

(i) **Emergency situations.** A written operational plan for emergency situations shall be developed for each facility storing, handling, or otherwise using vinyl chloride as a liquid or compressed gas. Appropriate portions of the plan shall be implemented in the event of an emergency. The plan shall specifically provide that:

(1) Employees engaged in hazardous operations or correcting situations of existing hazardous releases shall be equipped as required in paragraph (h) of this section;

(2) Other employees not so equipped shall evacuate the area and not return until conditions are controlled by the methods required in paragraph (1) of this section and the emergency is abated.

(j) **Training.** Each employee engaged in vinyl chloride or polyvinyl chloride operations shall be provided training in a program relating to the hazards of vinyl chloride and precautions for its safe use.

(1) The program shall include:

(i) The nature of the health hazard from chronic exposure to vinyl chloride including specifically the carcinogenic hazard;

(ii) The specific nature of operations which could result in exposure to vinyl chloride in excess of the permissible limit and necessary protective steps;

(iii) The purpose for, proper use, and limitations of respiratory protective devices;

(iv) The fire hazard and acute toxicity of vinyl chloride, and the necessary protective steps;

(v) The purpose for and a description of the monitoring program;

(vi) The purpose for, and a description of, the medical surveillance program;

(vii) Emergency procedures;

(viii) Specific information to aid the employee in recognition of conditions which may result in the release of vinyl chloride; and

(ix) A review of this standard at the employee's first training and initial training program, and annually thereafter.

(2) All materials relating to the program shall be provided upon request to the Assistant Secretary and the Director.

(k) **Medical surveillance.** A program of medical surveillance shall be instituted for each employee engaged, without regard to the time of exposure, to vinyl chloride in excess of the action level. The program shall provide each such employee with an opportunity for examinations and tests in accordance with this paragraph. All medical examinations and procedures shall be performed by or under the supervision of a licensed physician, and shall be provided without cost to the employee.

(1) At the time of initial assignment, or upon institution of medical surveillance:

(i) A general physical examination shall be performed, with specific attention to detecting enlargement of liver, spleen or kidneys, or dysfunction in these organs, and for abnormalities in skin, connective tissues and the pulmonary system (See Appendix A).

(ii) A medical history shall be taken, including the following topics:

(A) Alcohol intake;
(B) Past history of hepatitis;
(C) Work history and past exposure to potential hepatotoxic agents, including drugs and chemicals;
(D) Past history of blood transfusions; and

(E) Past history of hospitalizations.

(iii) A serum specimen shall be obtained and determinations made of:

(A) Total bilirubin;
(B) Alkaline phosphatase;
(C) Serum glutamic oxaloacetic transaminase (SGOT);
(D) Serum glutamic pyruvic transaminase (SGPT); and
(E) Gamma glutamyl transpeptidase.

(2) Examinations provided in accordance with this paragraph shall be performed at least:

(i) Every 6 months for each employee who has been employed in vinyl chloride or polyvinyl chloride manufacturing for 10 years or longer; and

(ii) Annually for all other employees.

(3) Each employee exposed to an emergency shall be afforded appropriate medical surveillance.

(4) A statement of each employee's suitability for continued exposure to vinyl chloride including use of protective equipment and respirators, shall be obtained from the examining physician promptly after any examination. A copy of the physician's statement shall be provided each employee.

(5) If any employee's health would be materially impaired by continued exposure, such employee shall be with-

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drawn from possible contact with vinyl chloride.

(6) Laboratory analyses for all toxicological specimens included in medical examinations shall be performed in laboratories licensed under 29 CFR Part 143.

(7) If the examining physician determines that alternative medical examinations to those required by paragraph (b)(1) of this section will provide at least equal assurance of detection and lead to a more prompt return to the exposure to vinyl chloride, the employer may accept such alternative examinations as modified the requirements of paragraph (b)(1) of this section if the employer obtains a statement from the examining physician stating that the alternative examinations and the rationale for modification. This statement shall be available upon request for examination and copying to authorized representatives of the Assistant Secretary and the Director.

(d) Signs and Symptoms. (i) Employees to be regulated areas shall be posted with a placard bearing the legend:

CANCER-SUSPECT AGENT AREA AUTHORIZED PERSONNEL ONLY

(2) Areas containing hazardous operations or where an emergency currently exists shall be posted with legible placards bearing the legend:

CANCER-SUSPECT AGENT IN THIS AREA PROHIBITED ENTRY UNLESS AUTHORIZED PERSONNEL ONLY

(3) Containers of polyvinyl chloride resin waste from reaction or other waste contaminated with vinyl chloride shall be legibly labeled:

Contaminated with
VINYL CHLORIDE CANCER-SUSPECT AGENT

(4) Containers of polyvinyl chloride shall be legibly labeled:

POLYVINYL CHLORIDE (or TRADE NAME)
Carcinogen

VINYL CHLORIDE
VINYL CHLORIDE IS A CANCER-SUSPECT AGENT

(5) Containers of vinyl chloride shall be legibly labeled either:

(i) VINYL CHLORIDE
EXTREMELY FLAMMABLE GAS UNDER PRESSURE
CANCER-SUSPECT AGENT

or (ii) In accordance with 49 CFR Part 173, Subpart H, with the additional legends:

CANCER-SUSPECT AGENT

applied near the label or placard.

(6) No statement shall appear on or near any required sign, label or instruc-

tion which contradicts or detracts from the effect of any required warning, information or instruction.

(iii) Records. (1) All records maintained in accordance with this section shall include the name and social security number of each employee where relevant.

(2) Records of required monitoring and measuring, medical records, and authorized personnel records shall be made and shall be available upon request for examination and copying to authorized representatives of the Assistant Secretary and the Director.

(i) Monitoring and measuring records shall:

(A) State the date of each monitoring and measuring and the concentrations determined and identify the instruments and methods used;

(B) Include any additional information necessary to determine individual employee exposures where area exposures are determined by means other than individual monitoring of employees; and

(C) Be maintained for not less than 30 years.

(ii) Authorized personnel records shall be maintained for not less than 30 years.

(iii) Medical records shall be maintained for the duration of the employment of each employee plus 20 years, or 25 years, whichever is longer.

(3) In the event that the employer ceases to do business and there is no successor to receive and act on his records for the prescribed period, the records shall be transmitted by certified mail to the Director, and each employee individually notified in writing of this transfer.

(4) Employees or their designated representatives shall be provided access to examine and copy records of required monitoring and measuring.

(5) Former employees shall be provided access to examine and copy required monitoring and measuring records reflecting their own exposures.

(6) Upon written request of any employee, a copy of the medical record of that employee shall be furnished to any physician designated by the employee.

(ii) Reports. (1) Not later than 1 month after the establishment of a regulated area, the following information shall be reported to the OSHA Area Director. Any changes to such information shall be reported within 15 days.

(i) The address and location of each establishment which has one or more regulated areas; and

(ii) The number of employees in each regulated area during normal operations, including maintenance.

(3) Emergencies. (i) The facts obtainable at that time, shall be reported within 24 hours to the OSHA Area Director. Upon request of the Area Director, the employer shall submit additional information in writing relevant to the nature and extent of employee exposures and measures taken to prevent future emergencies of similar nature.

(ii) Within 10 working days following any monitoring and measuring which discloses that any employee has been exposed, without regard to the use of respirators in excess of the permissible exposure limit, each such employee shall be posted in writing of the results of the exposure measurement and the steps being taken to reduce his exposure to within the permissible exposure limit.

(4) Effective Date. (i) Until January 1, 1975, the provisions currently set forth in § 1910.97 of this Part shall apply.

(ii) Effective January 1, 1975, the provisions set forth in § 1910.97 of this Part shall apply.

APPENDIX A—SUPPLEMENTARY MEDICAL INFORMATION

When required to be under paragraph (b)(1) of this section, the information in the table should be recorded as soon as possible, preferably within 1 to 4 weeks. If tests remain abnormal, the duration should be given to withdrawal of the employee from contact with vinyl chloride, while a more comprehensive examination is made.

Additional tests which may be useful:

A. Pulmonary function: vital capacity for 15 minutes, and blood cells, and exhalative abnormality.

B. Pulmonary function: Forced vital capacity, Forced expiratory volume at 1 second, and chest roentgenogram (posterior-anterior, 14 x 17 inches).

C. Additional serum tests: Lactic acid dehydrogenase, lactic acid dehydrogenase isoenzyme, protein determination, and protein electrophoresis.

D. For a more comprehensive examination on repeated abnormal serum tests: Hepatitis B antigen, and liver scanning.

(Secs. 6 and 8, 84 Stat. 1596, 1599 (29 U.S.C. 656, 657); Secretary of Labor's Order No. 12-71, 36 FR 6551)

Signed at Washington, D.C., this 1st day of October, 1974.

JOHN STUBBS,
Assistant Secretary of Labor.

[FRT Doc. 74-23173 Filed 10-1-74; 3:54 pm]

UNITED STATES OF AMERICA
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

PETER J. BRENNAN, SECRETARY OF LABOR
UNITED STATES DEPARTMENT OF LABOR,

Complainant,

v.

WESTERN ELECTRIC,

Respondent.

U. S. DEPARTMENT OF LABOR

OSHAIRC DOCKET

NO. 3902

MAR 3 1975

KANSAS CITY, MISSOURI
OFFICE OF THE SOLICITOR

Federal Building,
Room 140,
601 East 12th,
Kansas City, Missouri,

Tuesday, January 8, 1975.

The above-entitled matter came on for hearing,
pursuant to notice, at 9:00 o'clock a.m.

BEFORE:

THE HONORABLE PAUL E. DIXON, Judge.

APPEARANCES:

EUGENE F. DE SHAZO, ESQ., Office of the Solicitor,
United States Department of Labor, 2106
Federal Office Building, 911 Walnut, Kansas
City, Missouri, 64106, appearing on behalf of
the Complainant.

LAUREL J. MC KEE, ESQ., Western Electric, 195
Broadway, New York, New York, 10007, appearing
on behalf of the Respondent.

I N D E X

WITNESSES:DIRECTCROSSREDIRECTRECROSS

EXAMINER

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Albert Stewart

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54; 62

& 65

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4	R-19	144	(rejected)
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P R O C E E D I N G S

JUDGE DIXON: Let the hearing be opened. This hearing is brought under the authority of the Occupational Safety and Health Act of 1970 following Complaint alleging certain violations of standards promulgated by that Act. An Answer has been filed by the Respondent and the case is at issue. This action is designated as United States Department of Labor versus Western Electric, Respondent, Docket Number 8902.

The Department of Labor is represented by Mr. Eugene F. DeShazo. The Respondent is represented by Mrs. Laurel J. McKee.

I believe my file reflects that notice has been sent out to the affected Union, but we received no letter of participation from any Union. Can Counsel advise? Is there anyone here present from the Union that wishes to participate?

MRS. MCKEE: No.

JUDGE DIXON: Can we agree that the Courtroom is silent?

MRS. MCKEE: Yes.

MR. DESHAZO: Yes.

JUDGE DIXON: The conduct of the proceedings will be in conformity with the proceedings of the Federal Rules of Civil Procedure and the Administrative Procedure Act.

1 The proceedings will be recorded by the Argie
2 Reporting Service, a Court Reporter, and a transcript
3 will be made. Transcripts will be available to any party
4 at their cost.

5 Except for abatement proceedings, the burden of
6 proof rests with the Secretary of Labor.

7 Each party shall within twenty days after certifica-
8 tion by me of the record file with me proposed findings
9 of fact, conclusions of law, and an order accompanied
10 by a brief memorandum supported by citation of statutes,
11 decisions, and other authorities.

12 Is the attorney for the Department of Labor ready?

13 MR. DESHAZO: Yes, we're ready.

14 JUDGE DIXON: Is the Respondent ready?

15 MRS. MCKEE: Yes.

16 JUDGE DIXON: Do we have any stipulations to enter
17 into the record before we commence?

18 MR. DESHAZO: Well, Judge, just prior to the
19 hearing we have--Counsel and the Judge have conferred
20 and stipulated that as to Respondent's name and corporate
21 status and address.

22 JUDGE DIXON: That was Paragraph No. 1 of the
23 Complaint.

24 MR. DESHAZO: Paragraph No. 1 of the Complaint.
25 As stipulated to the facts alleged in Paragraph No. 2

1 of the Complaint--

2 JUDGE DIXON: That applies as to the time of the
3 inspection:

4 MRS. MCKEE: That's right.

5 JUDGE DIXON: On the number of employees.

6 MR. DESHAZO: Yes, I understand it is somewhat less
7 now, but at the time of the inspection it was approxi-
8 mately--

9 JUDGE DIXON: The Respondent is an employer within
10 the meaning of the Act and subject to the Act?

11 MRS. MCKEE: That's correct.

12 JUDGE DIXON: In Paragraph No. 3, pertaining to the
13 inspection and issuance of the Citation, is that admitted?

14 MRS. MCKEE: It is.

15 JUDGE DIXON: And Paragraph No. 4--

16 MR. DESHAZO: Is in issue.

17 JUDGE DIXON: That says to the Respondent's opera-
18 tion in connection with the use of vinyl chloride.

19 MR. DESHAZO: And with respect to the proposed
20 penalty of \$30.00 in this case, the parties agree that
21 if the Department of Labor prevails in its position with
22 respect to the monitoring in Paragraph No. 4 of the
23 Complaint, that the \$30.00 penalty would be a reasonable
24 penalty.

25 JUDGE DIXON: We do have an allegation as to abate-

1 ment of July 19, 1974. Now abatement in light of the
2 Citation would be, if I understand the file correctly,
3 that monitoring be commenced. Would that be what they
4 meant by the abatement; commence monitoring by July 19,
5 1974?

6 MR. DESHAZO: Yes.

7 JUDGE DIXON: And Respondant's response to that
8 would be that you had, as I understand from my brief
9 here ^{our} and conference, that monitoring was in progress at
10 the time of the Citation. Is that correct? Or that
11 a monitoring program had been commenced?

12 MRS. MCKEE: A monitoring program had been commenced,
13 but we did not believe that this particular project was
14 required to be monitored under the standard.

15 JUDGE DIXON: But you had no quarrel with the
16 abatement date?

17 MRS. MCKEE: That's correct.

18 JUDGE DIXON: Anything further that either party can
19 think of?

20 MR. DESHAZO: I have nothing further.

21 JUDGE DIXON: Do you want to proceed?

22 MR. DESHAZO: Yes, we will call Albert Stewart.

23 Whereupon,

24 ALBERT STEWART

25 was called as a witness by and on behalf of the Complainant

1 and, having been first duly sworn, was examined and testified
2 as follows:

3 DIRECT EXAMINATION

4 BY MR. DE SUAZO:

5 Q Will you state your name and occupation, please?

6 A Albert Stewart, Industrial Hygienist.

7 Q By whom are you employed?

8 A The United States Department of Labor, Occupational
9 Safety and Health Administration.

10 Q How long have you been so employed, Mr. Stewart?

11 A August 18, 1971.

12 Q Was when you came to work?

13 A With the Department of Labor.

14 Q Now what are your duties as an Industrial Hygienist?

15 A In our function in the Department of Labor, our
16 function is to evaluate and to determine by scientific methods
17 whether or not the environment is safe from the point of view
18 of the inhalation of materials or overexposure of the body to
19 external substance.

20 Q Prior to assuming your--would your duties include
21 among other things sampling for vinyl chloride in the atmos-
22 phere in various employe's workplaces?

23 A Yes, it does.

24 Q Prior to assuming your duties with the Department of
25 Labor, did you receive any training from the Department of

1 Labor?

2 A Yes. The Department of Labor trains all personnel
3 prior to permitting them to make inspections. My training
4 took place in Washington, D.C. and Cincinnati, Ohio.

5 Q What was the nature of this training?

6 A There are specified programs which consist--the
7 first phase is the Act itself is fully explained and hope-
8 fully learned. The standards are reviewed page by page. We
9 are instructed on conduct of inspections, the manner in which
10 we are to behave, the information that is to be given to
11 employer and employees. This is the basic essentials of the
12 compliance aspect of it.

13 The second phase is more of a specified training
14 for determining the competence of the field in which you are
15 working. If you are in the safety area, then you are review-
16 ed and given special training in aspects of safety.

17 Industrial Hygienists are given a course in review
18 of instrumentation, how to use and where to use sampling
19 techniques.

20 The idea of special target emphasis programs, say,
21 cotton or lead or carcinogenic materials; then there may
22 be special emphasis programs, which I attended too, in addition
23 to the first two phases of training. This has been on the
24 development of the carcinogenic aspect of the standards which
25 was added after my initial training. And then we had a special

1 program of short duration of a couple of days involving the
2 vinyl chloride aspects in particular.

3 Q Now prior to assuming your role with the Department
4 of Labor, have you had any other experience in the field of
5 safety and health?

6 A Yes. My background in the area of accident preven-
7 tion which in my own way of thinking consists both of safety
8 and industrial hygiene. The emphasis had been specifically in
9 the industrial hygiene aspect primarily in the chemical in-
10 dustry of approximately fifteen years.

11 JUDGE DIXON: Mr. Stewart, excuse me. Can you hear
12 him back there? Somehow your voice is deflecting off
13 and we are barely hearing you. Would you speak a little
14 louder? Go ahead, sir.

15 A The experience is approximately fifteen years.

16 Q Have you--well, let me ask you this: Have you had
17 any working experience in the fields related to industrial
18 hygiene, such as chemistry?

19 A Yes, that's how I got into the field of industrial
20 hygiene really. It's because I'm schooled in the field of
21 chemistry and I've taught chemistry both at secondary and at
22 college levels. And as such, in summer employment was working
23 for Commercial Laboratories and then that led into the full
24 time position at Commercial Laboratories. So I worked as
25 what is commonly called a bench chemist in conjunction with

1 the field of industrial hygiene, and in conjunction with in-
2 dustrial hygiene, the chemistry portion of industrial hygiene.

3 Q What's the level of your educational attainment?

4 A I have two Masters. One is in the field of educa-
5 tion in which case I did take graduate work in chemistry and
6 in mathematics. My second Masters is in the field of business
7 administration with its primary interest in human behavior.

8 Q Are you a member of any professional organizations?

9 A I belong to the American Society of Safety Engineers.
10 I belong to the American Industrial Hygiene Association,
11 the American Conference of Governmental Industrial Hygienists,
12 the American Chemical Society and a professional fraternity,
13 chemistry fraternity, Alpha Chi Sigma.

14 Q Have you ^{authored} offered any publications in the field of
15 Industrial Hygiene?

16 A I have published and I presented approximately nine
17 papers, one has been in the area of eye protection in the area
18 of laboratories in industry primarily related to chemical ex-
19 posures to the eye which needs protection. One was on the
20 development of technique of sampling for methylene chloride
21 in industrial plants, the analytical method of detecting the
22 concentration by means of Gas Chromatography.

23 Q Mr. Stewart, you are a Certified Industrial
24 Hygienist, is that correct?

25 A Yes, I became certified this last May in the compre-

1 hensive practice of industrial hygiene.

2 Q Who is it that certifies Industrial Hygienists?

3 A The American Board of Industrial Hygiene.

4 Q On May 31, 1974, did you have an occasion to visit
5 the Lee's Summit workplace of the Respondent, Western Electric?

6 A Yes. I and the young man who works with me per-
7 formed an inspection on May the 31st.

8 Q Was that in connection with your duties with the
9 Department of Labor?

10 A Yes. It was an official visit. I have a friend
11 there and we work together sometimes, but we never go to his
12 plant unless it is an official function.

13 Q What was the purpose of your visit to Western
14 Electric on that day?

15 A Western Electric had been referred by one of our
16 Safety Engineers on a previous inspection. He was interested
17 in having us evaluate fumes resulting from soldering opera-
18 tions. And that was the purpose of the visit.

19 But in addition, we have other responsibilities that
20 we enter. We conduct an inspection within the framework
21 of the time that's allotted.

22 Western Electric is a very major size facility.
23 It's plant is a new plant. It's a good plant. In my mind, I
24 had determined that I would like to have looked in addition
25 to the soldering operations other areas of aspects related

1 to health that I knew they were using.

2 In the opening conversations with the Employer, we
3 stated the purposes of evaluating not only the soldering
4 operations, but other aspects of it, particularly they were
5 defined, then we ^{would} take the liberty as we walked through, if
6 there were other operations that we were not aware of that we
7 might want to look at them also.

8 MR. DE SHAZO: Your Honor, in the interest of speed-
9 ing this up a little bit, could I ask if Respondent has
10 any objections as to the general method of the inspection
11 made by the Compliance Officer. Are you contesting the
12 fact that he did not present his credentials, that he
13 did not make his inspection?

14 MRS. MC KEE: No, we have no objection to the
15 general formal conduct of the investigation.

16 MR. DE SHAZO: O.K. Then I presume we can proceed
17 directly to the--

18 JUDGE DIXON: If they are satisfied the inspection
19 was conducted in good form, then you could go on to the
20 merits of the inspection.

21 Q (By Mr. DeShazo) Now, Mr. Stewart, you inspected the
22 plant for various airborne substances. Among those was
23 vinyl chloride included?

24 A Yes.

25 Q Approximately where in the plant was your test for

1 vinyl chloride conducted?

2 A There was only one sampling process done. And that
3 was done in Building No. 50. I believe they called the area
4 the Induction Area. That may not be the proper term, but it's
5 Building No. 50, an open area primarily where they perform
6 certain kinds of potting operations, encapsulations.

7 JUDGE DIXON: Excuse me, Mr. DeShazo, would you define
8 what a potting operation is as best you can in layman's
9 terms?

10 A Encapsulation or potting is a process where some
11 separate substance is enclosed primarily with plastic materials.
12 It could be rubber in addition to plastic. For instance, a
13 pencil is enclosed. The lead is enclosed with wood. If this
14 were a piece of wire, and then would be totally enclosed with
15 a plastic material, the process to do this would be called en-
16 capsulation or potting.

17 Q (By Mr. DeShazo) Is that synonymous with encapsulation?

18 A Encapsulation means total enclosure. Potting means
19 only a portion is covered with material.

20 JUDGE DIXON: Is this a work of art in chemistry
21 or industry?

22 THE WITNESS: It is a common thing in the electric
23 component industry.

24 JUDGE DIXON: They use this in the electrical industry
25 to describe the operation?

1 THE WITNESS: Yes.

2 Q (By Mr. LeShazo) Now, Mr. Stewart, was any repre-
3 sentative of Western Electric with you during this particular
4 test for vinyl chloride?

5 A Yes. We are always accompanied by representatives
6 of the employer. Employee's representatives may be asked to,
7 but in this case, the Employer's representative was Gene
8 Widner.

9 Q Is he present in the room today?

10 A Yes, he is.

11 Q And he too is an Industrial Hygienist, is that
12 correct?

13 A Yes, he is.

14 Q Did he assist you in any way in making your in-
15 spection?

16 A Yes, Gene is the friend I alluded to earlier. He
17 was very, very cooperative. He was most helpful in many
18 respects. The material that was in question was material
19 that was identified by observation. And once Gene and I saw
20 it, then we proceeded back to his office where he ran it
21 through a computer readout that they have of their products
22 in their plant. We found the manufacturer of the material
23 and then quickly called him immediately to find out questions
24 that at that point in time he didn't know.

25 Q Let's go back to where the material was located for

1 a moment. Would you describe please perhaps a floor plan of
2 this small area where the vinyl chloride was sampled?

3 A The area consisted of--

4 MRS. MC KEE: Could we go off the record a minute?

5 JUDGE DIXON: Surely.

6 (Discussion off the record.)

7 JUDGE DIXON: Back on the record. Please proceed
8 with your description.

9 A The area in question is an area of approximately,
10 well, where the tank itself--there was a tank involved. That
11 tank consisted of a very small area of no more than five feet
12 in width and maybe five foot square perhaps. This tank was
13 surrounded by workbenches, only one of which was occupied at
14 the time. And immediately east of the tank itself was a row
15 of chemical laboratory hoods. They are used for ventilation,
16 and these are the back sides of them, so it appeared just as
17 a wall. They were approximately six feet high.. The ceiling
18 height is approximately 18 to 20 feet high. The rest is
19 space just being open for lighting and utilities.

20 Q Now to clarify a point, when you say laboratory
21 hoods, are these vent fans? In other words, in common parlance,
22 exhaust air from the area?

23 A Yes.

24 Q And there are six of them?

25 A No. They are about six feet high. A laboratory hood

1 or a hood that's used of this nature is simply a grey box
2 with an opening and it is enclosed on three of its sides and
3 has a vent at the top. And the opening is made with a window
4 so you can raise and lower it.

5 JUDGE DIXON: But it exhausts immediate air?

6 THE WITNESS: Right. But since it is enclosed on
7 all sides, it's at the window. The work is performed
8 inside the hood and this^{is} controlled by raising and lower-
9 ing the sash. Now this was the back side of this that
10 was facing the tank, the side not with the window, the
11 side not open.

12 Q (By Mr. DeShazo) Now to clarify, there is a tank
13 which contains a substance that you sampled for possible
14 vinyl chloride contamination, is that correct?

15 A Yes. This tank is quite small, approximately 18
16 inches wide, it is 18 by 24.

17 Q O.K. Now on one side of this tank you said there is
18 this hood, but it appears from looking at it from the tank
19 side, this hood appears as a partition would you say, running
20 from the floor to the top?

21 A That's correct, to the top of the hood approximately
22 six feet.

23 Q Now the hood itself actually opens on the other side
24 of this tank itself?

25 A Yes, that's correct, which is an employee's work

1 station.

2 Q Go ahead with your description.

3 A The tank itself, as indicated earlier, is probably
4 made out of stainless steel, at least it is stainless steel in
5 appearance. It's approximately 18 inches by 24 inches. It has
6 a removable lid, I believe a little handle on it just to
7 raise and lower it down when they are wanting to remove the
8 material from it.

9 The tank itself is identified with the words "poly-
10 vinyl chloride" written thereon.

11 Q Now on the side of the partition or hood away from
12 the tank, that would be the side where the hood opens out,
13 was there an employee located at this?

14 A Yes. There was one employee sitting at the work
15 station on a stool. There were approximately two other
16 employees in that area on the side where the opening for the
17 laboratory hoods are. In addition, there are these benches
18 which are in the vicinity of the tank, or workbenches, but
19 they were not occupied except for one employee who did come in
20 at a later time. During the sampling procedure she came in
21 and was there, but after we had already started the sampling.

22 Q Was the substance for which you sampled located
23 within this tank?

24 A Yes. The tank itself was identified as polyvinyl
25

1 chloride. And when we raised the lid, it contained a substance
2 that had a milk like appearance.

3 Q Were you able to ascertain the trade name or
4 description of the substance?

5 A Yes. Gene got ahold of the foreman in the area who
6 helped us. We found out that the material was identified by
7 him as a Hysol product.

8 JUDGE DIXON: Would you spell that please?

9 THE WITNESS: H-y-s-o-l, that is the manufacturer,
10 their supplier, and his number was GC 74321 or there-
11 abouts.

12 With that information, and before anything else
13 further was done, Gene and I then returned back to his
14 office and that's when Gene made the call.

15 Q (By Mr. DeShazo) And as a result of that call were
16 you able to determine the contents of the Hysol, or at least
17 the partial contents?

18 A Yes. I think again it shows good cooperation on
19 Western Electric's part because they had certain information
20 that he did not have, that he and I professionally felt would
21 give us all the answers we wanted. So he tried to go through
22 one phone system which was busy, so we didn't even worry
23 about it, he went direct and asked that I listen in on the
24 telephone conversation, which he did not have to do. The
25 both of us together, I listened and he talked.

1 I believe the Hysol's representative's name was
2 Hornberg, H-o-r-n-b-e-r-g. And Mr. Hornberg was knowledge-
3 able about this particular product. He stated to us on the
4 phone that it contains 55 percent of a polyvinyl chloride
5 dispersed in a plasticizer. There is more to the conversa-
6 tion, but that answers that particular question.

7 Q Could you elaborate for the benefit of us non-
8 chemists what you mean by polyvinyl chloride dispersed in a
9 plasticizer?

10 A Polyvinyl chloride is a product that is made from
11 vinyl chloride. Vinyl chloride is a gas; polyvinyl chloride
12 is a solid substance.

13 Dispersed means basically that they have taken this
14 solid substance and ground it up into very small partical
15 size, larger than face powder, but smaller than, say, sugar.
16 Then they will add a vehicle, or a solution, or a liquid, to
17 this so that it can be suspended. In this case, the term
18 in the plastics industry is that they call it a plasticizer.
19 The plasticizers in these materials used for potting serve
20 the function or the role of simply being the vehicle or the
21 liquid in which the plastic has been placed.

22 At this point in time, the plasticizer does not
23 interreact or react with the polyvinyl chloride at all. It
24 is serving simply as a vehicle. For instance, if you'll
25 recall when we used to make hot chocolate at home, you'd get

1 a can of cocoa; you'd take the cocoa and add it to the milk.
2 We would stir it, but the cocoa would not go into the solu-
3 tion. I'm not referring to the cocoa mixes we have now, but
4 just plain old chocolate, and we'd stir it and it would not
5 go into the solution. The material was not--the chocolate was
6 not dissolved with the milk in the solution, but only basically
7 in suspension. You can^{see} it in there; you could still see
8 particles of cocoa. It wasn't uniform. It tasted blough and
9 all that sort of stuff.

10 The PVC, PVC is the abbreviation for polyvinyl
11 chloride, the PVC basically is the cocoa; the milk is basically
12 the plasticizer.

13 Q What's the relation between vinyl chloride and
14 polyvinyl chloride? Does vinyl chloride change its charac-
15 teristics entirely when it is made into polyvinyl chloride,
16 or is it still there as vinyl chloride?

17 A Vinyl chloride is a gas, as indicated earlier. It
18 is colorless; it has many properties. You can think of it
19 just as air has properties. You can smell vinyl chloride.
20 Vinyl chloride has an extremely low boiling point, that's why
21 it is a gas, otherwise it would be in a liquid state. They
22 can get it into a liquid state too. Basically, it starts out
23 in a gaseous state.

24 They will take vinyl chloride in that gaseous
25 stage and by means of compression in a large vessel or tank

1 and also adding certain other materials to give it what is
2 known as a catalyst to increase and promote the chemical
3 reaction, they will cause these individual molecules of vinyl
4 chloride to become attached to each other, so we have a long
5 chain.

6 It's just as if we take and put on a piece of paper
7 "A", "A", "A", "A" and just interlock them with a little line.
8 We'd start out with one "A" and end up with as many "A's" as
9 we want to, depending on how long we want to write.

10 The manufacturer of polyvinyl chloride has certain
11 controls over how many molecules of vinyl chloride he wants
12 in there, but this is controlled by the chemist. He also can
13 control the temperature in the catalyst. When he ends up,
14 what was started out as a gas, ends up as a solid. It's
15 normally in the solid state. And this conversion from this
16 gas to the solid or this polymerization process is the
17 term which basically means they've taken one molecule and
18 they've joined it together with several molecules. They have
19 polymerized it. And this polymerization is known or has been
20 known that some of the individual molecules of vinyl chloride
21 in the gaseous state become entrapped; they are just enclosed.
22 That solid particle may contain a gaseous molecule.

23 JUDGE DIXON: Your last statement was that molecules
24 of gas are enclosed in a solid product you were describ-
25 ing?

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1 THE WITNESS: Yes. Does that answer what you were
2 asking?

3 MR. DE SNAZO: I believe so, yes.

4 Q (By Mr. DeSnazo) Now before we get into the actual
5 tests that you ran, as I understand and is it true that the
6 Hysol product was not being used at the time of your inspec-
7 tion, is that correct?

8 A It was not in use and it is my understanding it is
9 not used on a regular basis at all.

10 Q So you didn't see it in operation, but do you have
11 some notion as to what the process is out there which does in
12 fact use the Hysol product?

13 A I can't say that. I know that Hysol and exactly
14 how it is used--I know that Hysol is used by others. I know
15 how Western Electric uses other materials, but to say they
16 use Hysol in the same manner, I do not have that knowledge.

17 Q Do you know what type of operation they were per-
18 forming with the Hysol in that area?

19 A It is one of their potting areas, it is therefore--my
20 assumption is that they pot with it; they use it as a component
21 in potting operations or enclosures of electrical components
22 with plastics.

23 Q Are you familiar enough with what they do to describe
24 the process in greater detail?

25 A I can describe operations that I saw them do. The

1 operations as carried on in that particular department consist
2 of potting, harnessing electrical wiring by placing the wire
3 itself into a mold and then pouring chemical materials on top
4 of the wire or enclosing it.

5 Now they use a variety of chemical materials for
6 potting materials. I saw only one of them of the ones they
7 used.

8 MRS. MC KEE: I would like to object to this line
9 of testimony. I just don't see where it is getting us.
10 It doesn't really relate to the Citation.

11 JUDGE DIXON: Confine it to the use of vinyl
12 chloride.

13 Q (By Mr. DeShazo) Can you describe for us what
14 Western Electric does with the Hysol product from the time
15 it is put into the tank until it comes out a finished product?

16 A I know that this product is used in potting. I know
17 that the product Hysol is heated to approximately 350°
18 Fahrenheit. I know that there is probably only one employee
19 that does this process. It's carried on in a very small area;
20 it's a small item of production for them.

21 What the mold is, I do not have knowledge of.

22 Q Do I understand you to be saying then that they are
23 molding with that product similar to the other potting?

24 A Yes.

25 Q Are the arrangements that you have described--

1 JUDGE DIXON: Excuse me, Mr. DeShazo. Mr. Stewart,
2 in this potting process you are describing of heating to
3 350° Fahrenheit with one employee involved in the
4 operation. Was this an operation that you personally
5 observed or were you advised of this Employer's
6 Representative?

7 THE WITNESS: Yes. I was advised of the temperature
8 and of the number of people involved.

9 JUDGE DIXON: Did Mr. Widner advise you how they
10 used the Hysol product?

11 THE WITNESS: Yes, he advised me as to the tempera-
12 ture. Mr. Widner and the Foreman, the general foreman's
13 name, I think, is Bill Gardiner. He was involved with
14 it, because Gene--again Gene has a large responsibility
15 from the point of view of health of the major plant. So
16 if he did not know the answer, he went to the guy that
17 was responsible for this section and he got the answer.
18 So Bill Gardiner was the gentleman that was involved
19 with the conversations in the potting area.

20 JUDGE DIXON: Mr. Widner was with you and the three
21 of you were talking about the operation in order for you
22 to gain this information that the Hysol was heated to
23 350° Fahrenheit and that one employee was involved in the
24 operation?

25 THE WITNESS: The heating, the temperature part of it

1 came at a later conversation between Gene and I.

2 JUDGE DIXON: All right. I mean you gained this
3 information from the Respondent as to how they utilized
4 the product?

5 THE WITNESS: Right.

6 JUDGE DIXON: O.K. But it was not in operation when
7 you made your inspection?

8 THE WITNESS: It was not.

9 JUDGE DIXON: That's why I wanted to know where you
10 got the information.

11 THE WITNESS: That's correct.

12 Q (By Mr. DeShazo) Did Mr. Widner or Mr. Gardiner
13 inform you of the end product that was made from this product?

14 A No, they didn't and again the reason being that this
15 is a very common practice. They make electrical component
16 systems and to encapsulate a piece of wire is just like taking
17 a breath of air. It's just routinely, commonly. And what
18 that particular product was I do not know and did not even
19 pursue it.

20 Q Is it fair to say that they were using the Hysol
21 product to encapsulate wire one way or another?

22 A Yes.

23 Q Now given the Hysol product of polyvinyl chloride
24 suspended in the plasticizer, what would be the effect or the
25 reason for heating it to 350° Fahrenheit?

1 A Well, it's just like--I think I can explain it
2 better with the analogy of the cocoa bit again. The cocoa,
3 prior to its being heated, is simply in suspension. As we
4 said before, we can identify the individual particles of
5 chocolate there, but once we have heated it and permitted the
6 cocoa to dissolve into the milk, we now have a cup of hot
7 chocolate which is palatable and uniform. And it becomes
8 pleasant unless we haven't heated it very well and we have a
9 mess at the bottom of the glass.

10 But in the case of the Hysol product, this is what's
11 known as a single component system. It's a single component--
12 I may be going off base here, but many of their chemicals
13 that they use are two component systems. An "A" and a "B" are
14 put together in order to form the conditions of forming a
15 solid from the liquid. In the case of the Hysol product,
16 this material has to be heated in order to allow the dispersed
17 polyvinyl chloride, that which is just suspended in there, to
18 reach its fusion temperature, or temperature of melting point,
19 so that it can actually go into solution with the plasticizer.
20 It is now dissolved just like our cocoa is dissolved in the
21 glass of hot chocolate.

22 At this point, and only at this point, will the
23 action become irreversible. We cannot go back now and come
24 up with a liquid again. We've got and will have a solid. It
25 will become firm and will have all the properties that Western

1 Electric wants in that particular component.

2 JUDGE DIXON: Excuse me, Mr. DeShazo.

3 If I took a cold bucket of this Hysol and I took the
4 wire component and dipped it in, would it have the
5 necessary fusion reaction without heat?

6 THE WITNESS: It cannot.

7 JUDGE DIXON: It would not create the insulating
8 theory that I am attempting to achieve?

9 THE WITNESS: It cannot.

10 JUDGE DIXON: It has to be heated and fused to the
11 product that is being placed within it?

12 THE WITNESS: Even in the semi-paste state, it may
13 adhere, but it has to really react.

14 JUDGE DIXON: Would it bond on to the material?
15 I used a bad word.

16 THE WITNESS: It would not make a permanent bond, a
17 permanent seal.

18 JUDGE DIXON: The heat^{is} necessary to make the bonding
19 process effective? Is that what you're telling us?

20 THE WITNESS: It is necessary.

21 JUDGE DIXON: Is there any degree of heat rather
22 than 350° that will be effective or is that the critical--

23 THE WITNESS: Yes. The temperature ranges will de-
24 pend again upon the properties they want. But actually
25 on similar products, it ranges from about 260 to 370°

1 Fahrenheit. Now this is what Gene said that they use,
2 3500 Fahrenheit.

3 JUDGE DIXON: This will create the bond on the
4 electrical components being dipped into it?

5 THE WITNESS: Right.

6 JUDGE DIXON: Without the heat you cannot get it?

7 THE WITNESS: You cannot get it as a single
8 component system. In others that they have, they do not
9 have to use heat because they are getting their pro-
10 perties by putting two chemicals together.

11 JUDGE DIXON: O.K. I've got that concept.

12 Q (Br Mr. DeShazo) Be patient with us nonchemists.

13 The Judge was just now talking about a bond. I don't know if
14 he was talking about a bond of the polyvinyl to the wire or if
15 he was talking about the--

16 JUDGE DIXON: To the electrical component.

17 Q (By Mr. DeShazo) --the components within the Hysol
18 product bonding together?

19 JUDGE DIXON: My question was: To effectively put
20 the insulation on the component being dipped into it, I
21 understand that the heat also causes a release and
22 emulsification, if I can use that word, of the polyvinyl
23 within the plasticizer? Is heat required to do that, in
24 other words, to make it effective to bond as opposed to
25 no heat?

1 THE WITNESS: Heat is necessary in that situation,
2 yes. Heat is not always necessary in all situations,
3 but it is necessary in the situation that we are talking
4 about here.

5 JUDGE DIXON: Let's take the converse then. Without
6 heat, you would still have the vinyl chloride in suspen-
7 sion with the plasticizer--without heat, the raw con-
8 tainer--it would be in suspension with the plasticizer?

9 THE WITNESS: Right.

10 JUDGE DIXON: Now the heat is the next link to
11 converting this material into such a material that it
12 will adhere to what's placed within it to form the in-
13 sulating quality that you are looking for?

14 THE WITNESS: Yes.

15 JUDGE DIXON: And if placed in there cold, it will
16 not adhere or bond to the electrical component?

17 THE WITNESS: Yes.

18 JUDGE DIXON: Excuse me.

19 Q (By Mr. DeShazo) Do you know, does the temperature
20 of 350° have any relation to the melting point or to whether
21 the polyvinyl chloride does melt?

22 A It does. That's where the terminology, fuse, comes
23 from. It has to reach its fusing point in order to go into
24 solution. If it doesn't, it's not in solution and still
25 remains in suspension, and you do not have the qualities that

1 you are looking for. In fact, you can't have a jell to
2 occur. You're changing from a liquid to a solid state, or
3 from a semi-liquid to a solid state, and heat is necessary to
4 do that with this particular material.

5 Q Can you describe the procedure you used in testing
6 for vinyl chloride in the atmosphere?

7 A The procedure is what the Department of Labor uses
8 and they were followed and they are published. Gene observed
9 at each stage of it. Not only with Gene but with everybody
10 I'll try to explain what we are doing and how we are doing it
11 so that they have full knowledge of the test procedure. Our
12 procedures are determined by the National Institute of
13 Occupational Safety and Health. We, in the Department, don't
14 have anything to do with them; we just use them.

15 The procedure consists of utilization of a pump,
16 which I have with me. It is manufactured by Sipin, S-i-p-i-n.
17 It is a battery-operated pump. It's approximately an inch
18 thick, two inches wide and about four inches long. It has a
19 little counter on it like a digital counter with a switch on
20 the back. If you turn the switch on, it allows the little
21 diaphragm here to pull air through this metal nozzle at the
22 end of it, the opening. At the same time, it records the
23 number of times that diaphragm is moving.

24 So when I first flipped it on, it said 5341 and
25 now it says 5345, and it keeps moving at a specified rate.

1 This pump is placed on an employee's back with a
2 belt or in their shirt pocket, some convenient place for them,
3 and it is permitted to run for a specified time. Attached to
4 the pump is a piece of plastic tubing, and it is not polyvinyl
5 chloride. It is not made from a polyvinyl chloride.

6 MR. DE SHAZO: Could I interrupt for just a moment?
7 Let the record show that as Mr. Stewart is describing the
8 equipment, he is actually showing the equipment that is
9 used, but the Department is not offering this equipment.

10 A Attached to the end of the plastic tubing is a
11 holder, which is made also of plastic; the holder is of two
12 parts and is designed so that it will receive a sampling tube
13 itself. There is attached a clip which permits you to place
14 this entire apparatus then on the collar of the worker in the
15 vicinity of the mouth near the nose which we call the breathing
16 zone area.

17 In the case of Western Electric, not only did we do
18 this for one of the employees, but we took what we called area
19 samples by placing the clip inside the rim of the tank that
20 was stated to contain polyvinyl chloride. We placed inside
21 the plastic holder a tube that is approximately 2½ inches long
22 and maybe a quarter of an inch in diameter made of glass that
23 has been heat sealed on each end. This tube contains carbon
24 or charcoal. The charcoal is of two parts which has been
25 separated by means of a piece of glass wool inside of it.

1 We have no way of knowing, but we do know that the backup
2 portion has served to tell us that the first portion has been
3 saturated.

4 Q Now using the equipment that you have just
5 described, can you describe for us the actual procedure used
6 on May 31st to make the test?

7 A Well, the test wasn't made on May the 31st, which
8 was a technicality, which was a Friday, it was made on Monday
9 which was June the 3rd, I believe. We had to do some prior
10 work.

11 The reason I'm correcting the day is that you just
12 don't go out and put a pump on somebody and end up with a
13 result. There's a lot of background work that's involved
14 with it.

15 In other words, there are sample preparations that
16 are involved. This takes place in this case over the week-end.

17 For instance, the pump itself has to be and is
18 battery operated, so the battery has to be charged. We have
19 battery chargers which is simply a little black box that has
20 a little connector to it, and it plugs into an electrical
21 duplex outlet, and we can then make sure that our battery is
22 charged. In the case of this pump, I charged it at home over
23 the week-end.

24 In addition to that, making sure the battery is
25 going to operate for us, we have to know that the pump is

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1 it and turn it upside down so the glass stopper is now at the
2 top. You affix a piece of plastic tubing at the top of it
3 and you put the belt on. Then you place a dish of soap
4 bubbles, nothing more than like our kids use to make soap
5 bubbles with, liquid soap. Then you time by means of a stop
6 watch the amount of time that it takes that soap bubble to
7 travel one hundred milliliters on that burette, or "X" number
8 of milliliters. What you need to know is how fast it would
9 travel, how fast that soap bubble goes down that burette.
10 This is the field tester or field check and it is called the
11 primary standard. We do this routinely.

12 It was done with these pumps and that is what I
13 meant by preparation time involved with the inspection.
14 The--I forgot the question.

15 Q What is the actual testing procedure you used using
16 this equipment with which you got the sample?

17 A Now Gene and I are back in the area. We know there
18 was this one employee working at this laboratory on the
19 opposite side of the tank. She was the only person that seem-
20 ed to be fixed. It would be nice to know if she had an
21 exposure of some kind.

22 I'm also troubled with something else that goes
23 way back when. It has to do with this tube. I'm confused
24 whether I can ask you a question, or shall we just stick to
25 this point?

1 Q Let's stick with this.

2 A Well, anyway this employee that was in the area,
3 we did ask her if she would cooperate with us because we do
4 not demand that the employee wear the equipment. We asked
5 her voluntary participation. I simply told her what we'd
6 like to find out and would she mind, would she wear a pump
7 for us? We'd like to find out how much stuff is in the air
8 that she might be breathing, and she agreed.

9 So we went through the procedure of connecting the
10 hose and--well, Gene and I had to go get the equipment out of
11 the car first. We came back in, together we pulled our tubes
12 out; we pulled them open and identified the number, the number
13 inserted in the connector, placed the pump in the tube on the
14 employee, recorded the reading, turned the pump on, recorded
15 the time, also recorded the pump number which was 897 and 900.
16 We only have three of them. The serial number of the pump,
17 this particular one, is 897. The .55 of air per stroke is
18 recorded. We checked the setting; the setting of this pump
19 was set at a 2 which NIOSH tells us is approximately 20 cc.'s
20 a minute which is well below our 50 cc.'s a minute that our
21 instructions say we cannot exceed. The norm we have
22 approximately is 20 cc.'s a minute. At this flow rate setting,
23 we estimated we should leave the pump on for approximately
24 20 minutes, which we did.

25 At the end of the 20 minute time, we pulled the pump

1 off; turned the pump off; took it off from the lady; recorded
2 the ending; count stroke, count on the pump, and sealed the
3 collecting sampling device, or the glass tubing as we indicated
4 before, by placing plastic caps on the end of it.

5 We repeated this process two or three times. But
6 in those times we did not use an employee, we got an area
7 sample. We just simply raised the lid on the stainless steel
8 tank and placed the connector that I identified earlier inside
9 the rim, actually directionwise it would be the southeast
10 corner of that tank. We went through the same procedure we
11 did with the employee and approximately 20 minutes later we
12 took that one off, put another one on. We took samples
13 there; took that one off and then I took all three samples
14 at that point in time and left the premises and returned to
15 our office.

16 I packaged them per our instructions, with a double
17 liner, and mailed them to Salt Lake City.

18 The samples were taken. We identified the potential
19 at 9:00 o'clock; we sampled it at 10:00 o'clock; the samples
20 were finished at 11:00 o'clock. The samples were mailed and
21 on their way to Salt Lake City by 12:00 o'clock and I was
22 back on the premises by 12:30.

23 Q In connection with your preparation of these
24 samples, is there a Department of Labor Seal that is
25 generally put on these samples before they are mailed?

1 A Well, anyway he is the person who actually performed
2 the laboratory analysis that was specified in Item Number 11
3 which is vinyl chloride.

4 Q Approximately how much of the Hysol product was
5 stored in the area where you were at Western Electric?

6 A I'd estimate less than two gallons were in the tank.
7 They purchased it in one gallon quantities. So there would be
8 anywhere from one gallon to two gallons, a very small tank.

9 MR. DE SHAWO: I have no further questions.

10 JUDGE DIXON: This would be a natural time for a
11 recess. We'll recess for about ten minutes.

12 (Short recess.)

13 JUDGE DIXON: We are back on the record.

14 CROSS-EXAMINATION

15 BY MRS. MC KEE:

16 Q Mr. Stewart, when you were talking about this pro-
17 cess, you testified that heat was used. Do you know exactly
18 how the heat was applied or used in the process?

19 A I do not.

20 Q Do you have any direct knowledge of whether or not
21 the Hysol as it sat in the stainless steel container was
22 heated at all? Do you have any knowledge of that?

23 A Would you ask that again?

24 Q Do you know whether or not the Hysol as it sat in
25 the container was heated in any way?

1 A My knowledge comes from Gene. I understand that
2 it is heated, the Hysol that was in that tank.

3 Q Is it your understanding that it was heated in the
4 tank?

5 A No, not in that tank.

6 Q What is your understanding about where it was
7 heated?

8 A I don't know.

9 Q In any event, you did not see that process taking
10 place?

11 A I did not.

12 Q Judge Dixon asked you if you could take a cold
13 piece of wire into this Hysol and get the proper bonding--

14 JUDGE DIXON: I didn't say cold, I'm sorry, I want
15 to correct the statement. I just said if you dipped the
16 product into the 350°, is it necessary to have 350° for
17 adhesion or bonding? I didn't identify the source of
18 the heat either. He hadn't testified and I didn't want to
19 enhance the record.

20 Q (By Mrs. McKee) Let me ask a different question
21 then: If you dipped a piece of hot wire into the Hysol at
22 room temperature, room temperature Hysol, could the bonding
23 take place that you were describing?

24 A Yes. Yes, it would, because again it is the heat.
25 The heat source is not important.

1 Q O.K. Did you actually see the product that was
2 ped into this PVC?

3 A No.

4 Q You testified that the tubing on your pump arrange-
5 ment there was not polyvinyl chloride, what is it, if you
6 know?

7 A It is teflon.

8 Q That long tubing there?

9 A Yes.

10 Q You also testified that the amount of charcoal in
11 one of those little sampling tubes was .15 milligrams?

12 A Yes.

13 Q Is that correct, I'm not trying to--

14 A It is correct to the best of my knowledge. There
15 is a sheet there that has exact numbers on it.

16 Q O.K. You talked about this Hysol in your testimony;
17 if you were to characterize Hysol in a chemical way, would it
18 be appropriate to call it a plastisol?

19 A It is.

20 Q How would you define a plastisol?

21 A A plastisol is a material consisting of a resin; in
22 this case polyvinyl chloride. It could be other substances
23 in suspension with a plasticizer. Some manufacturers have
24 blends of plasticizers and depending again upon the properties
25 the plastisol as a class of potting materials are blended and

1 manufactured by various companies to give specific properties
2 that some customer has asked for. So there is a whole range
3 of them, just as there is a range of plasticizers that may be
4 used if a change of plastizer will change the property of that
5 plastisol.

6 Q O.K. Recalling the day when you and Mr. Widner
7 talked about that particular vinyl chloride operation referred
8 to in your direct testimony, do you recall looking at the
9 manufacturer's data sheet with him on that day?

10 A Yes.

11 Q Was that before or after you called the Manufacturer's
12 Representative?

13 A That was before. When you say data sheet, I need
14 to clarify.

15 Q What was it that you looked at?

16 A It was Gene's computer print out that he has of all
17 their products on that particular read out. There were
18 probably a hundred other products involved. He just goes
19 across; it's not a data sheet from that point of view.

20 Q So what you actually looked at was one line that
21 referred to Hysol?

22 A Right.

23 Q You don't recall looking at any other form or sheet
24 that was perhaps in more detail than this?

25 A No. At that time, I'm not sure that he had any.

1 Q Did you ever report any results of your sampling to
2 Mr. Widner?

3 A Yes, the results were received from our laboratory,
4 somewhere, it was either the 6th or the 7th of June, and Gene
5 was called when I got the results back on the telephone and
6 the results were given to him verbally on the telephone.

7 Q Do you recall what results you gave to him on the
8 phona?

9 MR. DE SHAZO: I object to that. It goes into
10 areas that were not covered in direct examination.

11 JUDGE DIXON: This is cross and nonrebuttal so he
12 can--

13 MR. DE SHAZO: It would still be hearsay. He did
14 not perform the actual analysis.

15 MRS. MC KEE: He did report.

16 JUDGE DIXON: I assume we are going to have the
17 analysis somewhere in evidence today and I assume it
18 might be disjointed, but if he had the analysis which
19 later is going to be testified to, I'm going to allow
20 him to answer that question.

21 A The results that were given to Gene over the
22 telephone again were the results that were given to me by
23 our laboratory. I gave him the sample tube number which I
24 don't have in my head, but I know the values. I can give
25 you the values but not the tube number from my head, but the

1 values were given to me as two parts per million, less than
2 two parts per million.

3 Q Can you associate those, if not with the sample
4 tube, with the areas that were sampled?

5 A Yes, I can give you that.

6 Q Would you do that for us?

7 A The breathing zone sample was less than two parts
8 per million. The two area samples were two parts per million
9 and less than two parts per million.

10 Q Can you distinguish between those area samples,
11 which was taken in which area?

12 A Both were taken at the same place, that is, the rim
13 of the tank, southeast corner.

14 Q Now in reporting less than two parts per million,
15 does that mean there would be any vinyl chloride present?

16 A Yes, it doesn't mean--

17 Q Explain in your own words.

18 A When the laboratory reports results to us less than
19 or even with a specific number, we're accustomed to thinking
20 like a number, like two parts per million, that's what you've
21 got, but in reality you don't really have two parts per
22 million. You have two parts per million plus or minus whatever
23 accuracies are involved with the laboratory's equipment and
24 skills.

25 MRS. MC KEE: And that accuracy will be testified

1 to later, Gene?

2 MR. DE SIZZO: Yes.

3 MRS. MCKEE: O.K. I don't want to ask this
4 witness that then.

5 A When we say it is two parts per million, we know
6 that the quantity that is involved is two parts within
7 plus or minus the accuracy of the laboratory. If this is
8 reported as less than two parts per million, this tells us
9 only that the quantity that is involved has reached whatever
10 their guidelines were. It's either at that point or below;
11 the less than two parts is an administrative directive that
12 NIOSH follows; not us.

13 Q (By Mrs. McKee) Do you know if that could mean
14 zero from your own knowledge?

15 A It could mean zero but again zero is a very rela-
16 tive term when you talk about that.

17 Q I'd like to assume a hypothetical for a minute:
18 If you had a PVC that was perfectly pure in the sense that
19 there was no trapped vinyl chloride molecules and if you
20 heated that, would you release any vinyl chloride?

21 A No. But that is not the case because if you
22 heated the PVC and there was no entrapped VC in it and you
23 got VC, it means that you destroyed the molecule and it is
24 no longer PVC.

25 Q At what point can you destroy the PVC molecule, so

1 that it again reverts to its vinyl chloride state?

2 A You can't.

3 Q You could never do that?

4 A You can't revert it back to vinyl chloride without
5 performing--with just applications of heat and that sort of
6 thing, you are going to decompose it and you are going to end
7 up with just its basic elements of carbon and hydrogen and
8 chlorine. You're not going to end up with the PVC molecule
9 again or VC.

10 Q You testified earlier in your testimony that you
11 did make other tests throughout the plant. Did you get any
12 results or any feedback on these other tests?

13 MR. DE SHAZO: I object to that as being immaterial.

14 JUDGE DIXON: I think it would go beyond the scope
15 of the pleadings. We're only talking about this one
16 specific area having been monitored for vinyl chloride.

17 Q (By Mrs. McKee) O.K. If there were VC monomer
18 involved in the solution Western Electric was using, would
19 that tend to come out at room temperature?

20 A It could come out at room temperature, yes.

21 Q Is it your testimony that if it were heated it
22 would come out more so?

23 A I think the heat process that's involved--it is
24 not--it causes the PVC to become in a fused, melt state, it's
25 liquid, and it is easier for a gas to escape at that point.

1 But if it has been entrapped as a solid, it doesn't mean that
2 the gas can't escape without the heat. In fact we know this
3 to be true, that VC is escaping from unheated PVC molecules.

4 MRS. MC KEE: That's all we have.

5 JUDGE DIXON: I just have sort of an extension to
6 Mrs. McKee's question.

7 EXAMINATION

8 BY JUDGE DIXON:

9 Q Assuming that we have this cold Hysol, and you
10 mentioned the manufacturer of this Polis--

11 A Plastisol.

12 Q Well, anyway this combination of 55 percent plus
13 the plasticizer, that in the SOP manufacturing procedure
14 there are molecules of vinyl chloride. Let's take that
15 basic premise, you testified in your direct testimony to
16 this, right?

17 A That's true.

18 Q Now following up on Mrs. McKee's question, I
19 wanted to ask you, what is the effect of the heat from
20 whatever source, whether you put a burner under the tank
21 or if you insert a hot product, would that have a tendency,
22 if assuming there are molecules of VC gas, to release that
23 gas into the atmosphere?

24 A You're going to get leaching or the escaping of
25 the VC monomer from the polyvinyl chloride at room tempera-

1 ture.

2 Q In other words, it is not required to release the
3 gas molecules?

4 A No, it isn't.

5 Q You mentioned a range from 260 to 370°, and I
6 thought there was some critical range you had to reach?

7 A That has to do with the fusion point with which the
8 PVC comes into solution with the plasticide.

9 Q Where it will adhere to the product being covered
10 by it?

11 A Right.

12 Q O.K. But the gas can be released at room tempera-
13 ture?

14 A Yes, sir.

15 CROSS-EXAMINATION (Cont'd.)

16 BY MRS. MC KEE:

17 Q Do you know if--you testified in direct examination
18 that you had received training for your job and specifically
19 for your job as Compliance Officer for the Occupational
20 Safety and Health Administration?

21 A Yes.

22 Q In the course of that, did you receive instructions
23 as to what a fabricated product was within the meanings of the
24 vinyl chloride standard?

25 MR. DE SHAZO: I object. It's too vague a term; if

1 it can be related to the facts of this case, I would say
2 it's proper, but in its vague abstract sense, it's just
3 not material to the issues before us.

4 JUDGE DIXON: I'm going to overrule the objection
5 because that is a portion of the standard and this man
6 was trying to interpret the standards in his compliance
7 activities, so I'll let you answer if you can answer as
8 to what is meant by a fabricated product.

9 A A fabricated product is--we've been given instruc-
10 tions in Washington, but we still have to use our judgment as
11 to what a fabricated product is. Primarily it gets involved
12 with what is the situation. It's not a generalized statement.
13 I cannot, at least, define a fabricated product in the
14 abstract.

15 And to illustrate, you may say that this fabricated
16 product (indicating) is a table, but it very well could be a
17 bed if I were sleepy enough. It's very pragmatic.

18 In the case of your situation at Western Electric,
19 the material that we sampled was not a fabricated product,
20 because you don't just get a bottle or can of Hysol and use it
21 that way. You've got it for a purpose and you do something
22 with it. And in doing something with it, you end up with
23 something entirely different than what it is you bought in the
24 beginning.

25 Q What would you acknowledge as a fabricated product?

be in conjunction with the use of polyvinyl chloride?

1 That was my understanding of the question, if that's
2 the question.

3 Q (Ey Mrs. McKee) That's correct.

4 A I would say that in my judgment I consider PVC pipe
5 that has been extruded and purchased and used by everyone a
6 fabricated product containing polyvinyl chloride.

7 Q Upon what standards to you use to make that judgment?

8 A A layman, you and I, or a manufacturer can take that
9 piece of pipe and can utilize it without performing any
10 further operations to it.

11 Q O.K. Do you know of your own knowledge whether or
12 not vinyl chloride is released from a fabricated PVC pipe?

13 A Do I know whether it has been?

14 Q From your own knowledge?

15 A Yes, I do know from my own knowledge about vinyl
16 chloride and PVC in the making of the plastic pipe.

17 Q O.K. Moving on to the point where you regard it as
18 fabricated, do you know anything about the release of vinyl
19 chloride at that point?

20 A I have knowledge of others who have performed tests
21 to show that there is no vinyl chloride released.

22 Q That's your professional judgment, that there is no
23 vinyl chloride released?

24 A Yes.

25 Q I just have one more question. Would you regard

1 paint as a fabricated product?

2 A Paint. That's a good question.

3 Q That's why I asked it.

4 A Because the paint that you purchase in a gallon
5 bucket and apply it to the surface of something is not the
6 paint that you have on the surface here, because the chemical
7 reaction has not occurred.

8 Q When you say here, you point to the table?

9 A I'm pointing to the rim of paint around the table.
10 In order for the paint to have the properties that we want,
11 it has to age, air has to react with it, and it has to age.
12 And in this case, you talk about semantics; whether paint is
13 paint until after it has dried.

14 Q Let me ask you specific questions then. Is paint
15 in a gallon bucket as we commonly know it a fabricated product?

16 MR. DE SHAZO: Your Honor, I object to this line of
17 questioning, because it clouds the issue by obviously
18 trying to make paint seem like a gallon of Hysol. Nobody
19 goes to K-Mart or to the paint store and buys a gallon
20 of PVC in suspension. The chemicals in the paint are
21 already mixed together. It's not a suspension like you
22 have here. You're not taking something and making a
23 plastic coating out of it when you paint. All it's
24 doing is getting us away from the facts of this case and
25 into hypothetical situations that cloud the issues.

1 JUDGE DIXON: Do you intend to extend into this
2 much further?

3 MRS. MC KEE: This is it.

4 JUDGE DIXON: Go ahead and answer about the paint.
5 This is cross-examination of an expert witness.

6 A I can answer the paint by saying that if you've got
7 a gallon of paint in your basement, I would still be interest-
8 ed in the vapors that come off of it and its content, whether
9 it contains lead or uranium; what is the vehicle that it is
10 made out of and remain interested in it until such time as it
11 is dry and on the wall.

12 Q O.K. But in addition to your interest, would you
13 regard it as a fabricated product?

14 A No, I would not, because I have not divorced it from
15 my professional interest in how that paint is being used.

16 MRS. MC KEE: O.K. That's all I have.

17 JUDGE DIXON: All right. Let's try and if we can,
18 connect these basics up.

19 EXAMINATION (Cont'd.)

20 BY JUDGE DIXON:

21 Q With Respondent's operation, let's assume that
22 Respondent takes a raw piece of wire which has been heated
23 and dips it into this Hysol which either through the heat
24 of the product going into the Hysol or from the Hysol being
25 heated and the end result is a coated product, coated re-
ceptacle with plastic around it. Now is that a fabricated

1 product in that you have taken one element, a hot piece of
2 metal, and inserted it into another element, the Hysol, and
3 you've come out with a third, a coated piece of metal? Is
4 that process a fabrication?

5 A It's a process of fabrication and is a fabricated
6 product which you ended up with.

7 Q You've added two and two together and come up with
8 a fabricated product?

9 A Now put that piece of wire, it may be used yet in
10 the process of making something else in which case it is a
11 raw material.

12 Q Right. But isn't the common term when you take
13 one and mix it with something else and come up with number
14 three, isn't that the common term or understanding of fabri-
15 cating a product? It's an admixture of several ingredients?

16 A It's a process of whereby you are fabricating
17 something.

18 Q So much wire and insulation results in a fabricated
19 product; that is a process of fabricating, is it not?

20 A Yes.

21 Q It's this process that, again, arose the release of
22 vinyl chloride gas molecules, the heat plus the mixture with
23 the Hysol?

24 A No, not necessarily. We are interested in the
25

1 vinyl chloride aspects of this Hysol compound at room tempera-
2 ture as well as the heat.

3 Q We covered that before. You cleared me on that
4 that it would also release gas molecules at room temperatures?

5 A Right. The heat is necessary only for the reaction
6 to occur.

7 Q For the bonding?

8 A For the bonding.

9 JUDGE DIXON: I understand that O.K.

10 Anything farther of this witness?

11 MR. DE SHAZO: Yes.

12 REDIRECT EXAMINATION

13 BY MR. DE SHAZO:

14 Q Mr. Stewart, regardless of whether, this may have
15 been covered, regardless of whether the Hysol in the tank is
16 heated or whether it is cool and hot wire is dipped into it
17 the effect of the heat, as I understand your testimony so far,
18 is to create a solution, at least for a certain distance away
19 from the source of the heat, which will cause the vinyl
20 chloride suspension to bond with the plasticizer and form a
21 new compound, is that correct?

22 A Yes. That doesn't form a new compound, but it
23 forms the--it makes it possible for the material to adhere to
24 the wire in this case you are talking about.

25 Q Also to clear up a point that was made on cross,

1 that two of these samples that you took, or two area samples
2 were taken at the same place. Were those were taken at the
3 same time?

4 A They were not taken at the same time. It takes 20
5 minutes. The samples were run for a 20 minute duration. If
6 I recall correctly, we ran the samples in the tank, then we
7 ran the breathing zone. So we have a time lag between the
8 samples that were taken at the tank. I don't recall exactly
9 what this time lag was, but it would be somewhere in the
10 vicinity of 40 minutes, 20 minutes.

11 Q So the three 20 minute samples took approximately
12 60 minutes?

13 A They took exactly 57 minutes, because one was not 20
14 and one was--

15 Q What is the boiling point of vinyl chloride?

16 A Vinyl chloride's boiling point is listed in the
17 literature at -13° C. or something like that, in the neighbor-
18 hood of 13, 14, 15° centigrade, which is well below zero.

19 MR. DE SHERZO: I have nothing further.

20 JUDGE DIXON: I have a few.

21 EXAMINATION (Cont'd.)

22 BY JUDGE DIXON:

23 Q Mr. Stewart, the Citation charges the Respondent
24 with using a product which contains polyvinyl chloride and
25 not monitoring the ambient air of the area to determine

1 whether it contained vinyl chloride in concentration in ex-
2 cess of the standard. Did you, in the course of your investi-
3 gation, make an effort to determine what the Respondent's m
4 monitoring activities were with respect to vinyl chloride?

5 A Yes. I'm glad you asked me that. I've been
6 wanting to get it in.

7 Q Should I have not asked the question, is it one of
8 the pregnant questions I shouldn't have drawn?

9 A When I mentioned earlier that I was troubled with
10 something, that's what I was troubled with.

11 Gene, the people who work for him--I don't know
12 whether he personally, but it's my understanding from what he
13 said--now I did not see any records. But it's my understand-
14 ing that they sample various places throughout the plant.
15 They were sampling, in the case that was illustrated, with a
16 piece of pipe, where their maintenance people would put a
17 torch to it, so they ought to be able to tell you what the
18 results are in that case.

19 They also sample when they do wire stripping if they
20 use PVC as a coating on some of their cabling; they s
21 Again, Gene can tell you where and when and how and what his
22 results are. I've taken his word that he did sample.

23 He didn't sample this substance, the Hysol. We
24 identified it because it was labeled and we saw it. At that
25 point, Gene and I went to his office and traced it down to

1 see if it contained PVC and if it did did anybody sample it.

2 JUDGE DIXON: Thank you.

3 Anything else, Mr. DeShazo?

4 MR. DE SHAZO: No.

5 JUDGE DIXON: You're excused.

6 (Witness excused.)

7 MR. DE SHAZO: We will call Tano Lucero.

8 Whereupon,

9 TANO LUCERO

10 was called as a witness by and on behalf of the Complainant
11 and, having been first duly sworn, was examined and testified
12 as follows:

13 DIRECT EXAMINATION

14 BY MR. DE SHAZO:

15 Q Would you state your name for the record, please?

16 A Yes. It is Tano Lucero. T-a-n-o L-u-c-e-r-o.

17 Q Mr. Lucero, where are you currently employed?

18 A In Salt Lake City, at the NIOSH Lab. I work for the
19 Department of Labor.

20 Q NIOSH is, of course, the National Institute of
21 Occupational Safety and Health and it is part of the Department
22 of Health, Education and Welfare, is that right?

23 A Yes.

24 Q You are permanently employed there as a Department
25 of Labor chemist?

1 A Yes.

2 Q How long have you been employed at that particular
3 establishment?

4 A Since November 8, 1971.

5 Q What do your duties consist of at the Salt Lake
6 City Laboratory?

7 A I had been working for the last three years on
8 organic vapors, analyzing them by gas chromatography.

9 Q Do you have any opinion as to approximately how
10 many samples you have analyzed by this gas chromatography?

11 A Yes, in the last few years I think a conservative
12 number would be about six thousand.

13 Q And the gas chromatograph is the prime method you
14 use to analyze the tests for vinyl chloride, is that correct?

15 A Yes.

16 Q Is that the method that you used--well, strike that.
17 Prior to assuming your duties, did you have any formal train-
18 ing by either the Department of Labor or the Department of
19 Health, Education and Welfare?

20 A No formal training. It was all on-the-job.

21 Q What is the extent of your educational attainment?

22 A I graduated with a BS degree in chemistry from the
23 University of New Mexico.

24 Q Have you had any other job experience prior to
25 coming to work with the Department of Labor?

1 A The sample of the gas that is received on the char-
2 coal is put into the solution. That's the way we do it. It
3 can be done different ways, but in our specific case, we put
4 it into the solution and the gas chromatograph separates the
5 different components in the solution. And as they come out,
6 we measure the peak, the area under a peak that would give us
7 a quantative determination as to the concentration of each
8 component as they come out and they come out at different
9 times.

10 Q When you say a peak, you are referring, I believe,
11 to the strip chart that runs through with the needle that is
12 connected to the gas chromatograph, is that correct?

13 A Right.

14 Q And as you say, the different substances come out
15 at different times. Would you explain just what you mean by
16 come out? What do they have to do in order to come out? Is
17 there heat applied to them for a certain amount of time that
18 causes them to do this?

19 A The solution itself is vaporized and passed through
20 the gas chromatograph as gas. And each compound is retained,
21 depending on the column used, a specific time and the time as
22 it passes through the column. Each compound comes out at a
23 different time and each compound is then measured according to
24 the time it comes out.

25 Q Then, for example, in the vinyl chloride, do you

1 know how long the sample must be retained at a specific heat
2 before it begins recording on the strip chart?

3 A Retained at a certain heat? Do you mean--I don't
4 understand the question.

5 Q Let me ask you this then: With respect to vinyl
6 chloride, how long, what is the retention time, or how long
7 is vinyl chloride retained in your gas chromatograph before
8 it begins showing a reading on your strip chart?

9 A I think in this specific case it was close to two
10 minutes.

11 Q Is that retention time something that helps you to
12 identify a substance as vinyl chloride?

13 A Yes.

14 Q How did you determine the two minute retention time?
15 Is that against a standard of some sort?

16 A Yes, we prepare standards in the lab. And according
17 to the timing they come out, we identify them as a compound.
18 And for the different combinations, we prepare a calibration
19 curve which is linear with the flame ionization.

20 We set up the parameters of the computer so that
21 the computer will calculate the concentration and read it back
22 out to us on the teletype. So we have a print out of the
23 results.

24 Q Now on a strip chart readout for the gas chroma-
25 tograph, as we see a two minute retention time and start

1 getting a peak, then I understand from what you said that at
2 up to this point that that tells that it may be vinyl chloride
3 at that point, is that correct?

4 A Right.

5 Q Now if the peak on this strip chart or if the line on
6 the strip chart forms a peak, that is it moves from its
7 neutral position to the other side of the paper and then back
8 again to the neutral position, is there any quantitative
9 measurement that can be made from that strip chart as to the
10 amount of vinyl chloride that has been sampled in the gas
11 chromatograph?

12 A Even if the retention time is changed?

13 Q No, given the retention time, and you start to
14 get your peak and you have, in fact, gotten your peak and it
15 has returned back to normal, is there a way then to compute
16 the quantitative measurement of the vinyl chloride from that
17 peak?

18 A Yes.

19 Q How do you go about making that?

20 A Well, as I said before--

21 Q Not how the computer does it, but first of all,
22 very simply in fundamental terms so that we can get an idea
23 of what the gas chromatograph is doing. What does that peak
24 represent? Does it represent a quantitative measure?

25 A Well, we make up standards and we know the

1 concentration. And the computer acts like an integrator. Now
2 an integrator will integrate the area under peak and give us
3 a number for that area. Now that number is related directly
4 to the concentration that we've prepared, so we know the re-
5 lationship between the area, ⁱⁿ And the concentration that
6 we've prepared and this relationship, although we have an
7 unknown concentration, but we have an area of the sample and
8 we can calculate what the concentration is of that sample.

9 Q Now when you use the term an integrator, you are
10 talking about integration in the mathematical or calculus sense
11 of the word in finding the area under this curve, is that
12 correct?

13 A Right.

14 Q And it's that area that relates to the quantitative
15 measurement of vinyl chloride?

16 A (Nods affirmatively.)

17 Q Now getting back then to your computer, as I under-
18 stand, you've just stated that you have a computer or a
19 machine of some sort that does the integration on this and
20 it's not done by you or by a human being. It is done by the
21 machine, is that correct?

22 A That's right.

23 Q From the time you physically open a sample of the
24 vinyl chloride or whatever--

25 MRS. MC KEE: Excuse me, are we still talking about

1 the general process?

2 MR. DE SHAZO: Right.

3 Q (By Mr. Dashazo) In preparing for the injection
4 into the gas chromatograph, after you have done that, is
5 there any more, any further human step that needs to be done
6 before the result is read out on the gas chromatograph?

7 A Well, we usually put in an internal standard and
8 this eliminates a lot of variables that do occur in gas
9 chromatography: Various injections and variations sometimes
10 in conditions of the gas chromatograph.

11 Q How is the standard prepared?

12 A The standard is prepared usually in bulk form in
13 our solvent of carbon disulfide. In the case of vinyl chloride,
14 we use benzene as an internal standard. And the standards
15 that we prepare of vinyl chloride have our internal standard
16 with it and all the samples all have benzene, the internal
17 standard is in all the samples also.

18 This internal standard, knowing the concentration
19 of that, we can use that to quantitate the vinyl chloride
20 more accurately and it also cuts down on a lot of error in
21 gas chromatography.

22 Q Now, Mr. Lucero, you are the chemist, are you not,
23 who performed the actual analysis on these samples that Mr.
24 Stewart has testified to taking earlier, that is Laboratories'
25 Numbers W-9075, through W-9079?

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1 A Yes, sir.

2 Q Upon receipt of those samples, can you tell us, just
3 take us through physically the exact path that those samples
4 follow from the time they get to your laboratory until you
5 begin work on analyzing them?

6 A The samples are received into the laboratory and
7 logged in by my secretary. They are given a Lab. Number and
8 this number is put on the analysis, on the Sample Identifica-
9 tion Sheets and the sample.

10 The samples are then taken into a sample room which
11 is locked. If they are left overnight, which was not the case
12 in these vinyl chlorides, they are logged into another log book
13 where the Chief of the Chemistry Section, Dr. Hendricks
14 at this time, was assigning these samples out. I signed them
15 out the same day they came in and they were analyzed on the
16 same day and reported on the same day.

17 Q Do you recall what date that was?

18 A June 5, 1974.

19 Q Now once these samples are received by you per-
20 sonally, would you describe the process you go through to
21 prepare them for an injection into the gas chromatograph for
22 analysis?

23 A The sample, as Mr. Stewart said, is broken up into
24 two sections. There is an A portion and a B portion. The
25 A portion contains approximately 100 milligrams. The char-

1 coal contains 50 milligrams. They are put into two separate
2 vials and they are analyzed separately. One milliliter of
3 carbon disulfide is added to these. The vial used is a two
4 milliliter vial; it is sealed with a crimp-on teflon sealed
5 septum cap. And it is then loaded up into the gas chromato-
6 graph automatic sampler.

7 Q What is the purpose of putting the charcoal into the
8 carbon disulfide?

9 A The purpose is to desorb any vinyl chloride on the
10 charcoal. In the case that we are talking about here, the
11 charcoal used is SK C 104. It's petroleum based charcoal
12 which is not the best for collecting vinyl chloride. We find
13 that you get migration from the A to the B point after so many
14 hours, so many days I should say. And then after a week or
15 nine days, we even get a loss of the vinyl chloride. So the
16 vinyl chloride itself does not adhere to the charcoal that
17 readily; that's why they need to be sending the samples in
18 with the utmost speed and with the utmost speed we need to
19 analyze them as soon as they come in.

20 Q Is this carbon disulfide liquified at the time the
21 charcoal is placed in it?

22 A Yes, it is.

23 Q Do you have any opinion as to how long the vinyl
24 chloride is retained on the charcoal before you start losing
25 it or before the migration starts?

1 A We've done studies on it, not very extensive, we
2 should, but we've got enough information that we feel it's
3 about--the work has also been done, not only in Salt Lake
4 City but in the NIOSH Lab in Cincinnati, and desorption
5 efficiencies, or the percent desorbed, that we get off the
6 the charcoal is approximately 82 percent. We use this number
7 in our calculation of vinyl chloride reported out. So what
8 happens is we add another 13 percent to our results. The
9 results Cincinnati got were 82 percent; we got 85 percent.

10 After we prepared a gas bag of vinyl chloride and
11 analyzed it immediately, we determined that approximately 15
12 percent or 18 percent is still being adhered to the charcoal.
13 And after 48 hours, approximately 12 percent of the vinyl
14 chloride had migrated.

15 Now the concentration level that we're talking
16 about is at the TLV 50 parts per million. After 96 hours,
17 I think the migration level was 27 percent, 30 percent maybe
18 so--

19 Q Let me ask you this: Approximately how many hours
20 was it from the time--

21 A The samples were collected?

22 Q --the samples were collected until the time the
23 samples were analyzed?

24 A I would say 48 hours, two days, three days at the
25 most.

1 JUDGE DIXON: Surely.

2 (Short Recess.)

3 JUDGE DIXON: Back on the record.

4 Q (By Mr. DeShazo) Mr. Lucero, I just have a couple
5 of additional questions. You have indicated that the sen-
6 sitivity of the machine is something that is controlled by
7 you, at least in the limits that we are talking about now,
8 and that you or the people you work for have decided that
9 .3 is a sufficient sensitivity given the emergency standard,
10 is that correct?

11 A (Nods affirmatively.)

12 Q Now the emergency standard has a ceiling value of
13 50 parts per million. If this standard were set, for example,
14 at one part per million, would you adjust your sensitivity
15 level to deal with the low levels of vinyl chloride that we
16 have present here today?

17 A We have already; however as I understand it there
18 has been a restraint on that new TLV, so we're back at 50,
19 but we have adjusted our instrument.

20 Q These are low levels of vinyl chloride, aren't they?

21 A Yes.

22 MR. DE SHAZO: I have no further questions.

23 CROSS-EXAMINATION

24 BY MRS. MC KEE:

25 Q First, are you aware that the VC for hydrocarbon is

1 A In this specific case, we used a 20 foot PPAP.

2 Q That's a single column?

3 A Yes. PPAP stands for free fatty acid phase.

4 Q Is this a standard or a common column?

5 A It's a common column we use.

6 Q How do you obtain that column?

7 A We buy it directly from Prich and Elmer. It is
8 already packed.

9 Q That's the only column used in these tests?

10 A Yes.

11 Q And the temperature at which you ran the tests?

12 A 50° Centigrade.

13 Q You've indicated there was some ambiguity in your
14 results. Is there a reason why you didn't run the test
15 through a second column?

16 A Yes, there is.

17 Q What is that?

18 A The reason is that because usually we run it
19 through the second column when they are over the TLV.

20 Q And they were not over the TLV in this case?

21 A Right.

22 Q And would running the results through a second
23 column affect the accuracy of your results?

24 A The accuracy of the results?

25 Q The identification of what you were getting out of

1 the component.

2 A It would. In our specific case, what we would do
3 is go to a different type of a column. That would usually--
4 it's just a basic operation in gas chromatography to identify
5 a compound. What it does is it separates other components
6 that have like characteristics, polarities, boiling points,
7 whatever.

8 Q In using one column, would you regard the identifi-
9 cation of vinyl chloride as absolute?

10 A I would not guarantee an absolute using two columns.

11 Q What about using three?

12 A No. As an absolute identification, it gives you a
13 better identification than using one column. I'll admit that
14 is--you're running a risk of interferences; when using two
15 columns, you're decreasing that risk tremendously; three
16 columns, even more. You could just keep going. Four columns--
17 by the time you get down to ten columns, you've got it.

18 MRS. MC KEE: The Company has no further cross-
19 examination.

20 JUDGE DIXON: Any redirect?

21 REDIRECT EXAMINATION

22 BY MR. DE SHAZO:

23 Q I just have one question with regard to accuracy.
24 Although it hasn't been mentioned yet, there is another piece
25 of equipment that will measure vinyl chloride called a mass Spec-
trometer. If you use that in connection with the gas chroma-

1 tograph, would that be expected to 100 percent guarantee
2 that what you've got is any particular substance be it vinyl
3 chloride or something else.

4 A I would say pretty close, 99.9 percent. It's
5 definitely a lot better.

6 Q But in being a lot better and being absolute--I'm
7 trying to drive at the absolute--would that be an absolute
8 test?

9 A There are no absolutes. I would just say that you
10 get better and better as you go along. If you use a mass
11 spectro, a GC, a mass spectro and an IR, you're even a lot
12 better there.

13 Q I'm not going to ask you what an IR is.

14 MR. DE SHAZO: That's all.

15 JUDGE DIXON: May this witness be excused?

16 MR. DE SHAZO: Yes.

17 JUDGE DIXON: All right. He is excused.

18 (Witness excused.)

19 MR. DE SHAZO: The Government rests.

20 MRS. MC KEE: We have two witnesses.

21 JUDGE DIXON: All right. We will take our lunch
22 break now.

23 (Whereupon, at 12:15 o'clock p.m., the hearing was
24 recessed until 1:00 o'clock p.m., of the same day.)
25

1 A My address is 11319 Madison, Kansas City, Missouri.

2 Q Mr. Widner, where are you employed?

3 A Western Electric Company, Lee's Summit, Missouri.

4 Q How long have you been employed there?

5 A About sixteen years.

6 Q What is your job there?

7 A I'm classified as a Senior Engineer working in
8 Industrial Hygiene.

9 Q How long have you performed that job?

10 A A number of years. I've been in Industrial Hygiene
11 on and off since I started working for the Company. I was
12 promoted to Senior Engineer in the last five or six years.

13 Q O.K. What's your education background, Mr. Widner?

14 A I have two Bachelor's Degrees, one is a Bachelor of
15 Arts with a Major in Biology and a Minor in Physical Science,
16 and also a Bachelor in Chemical Engineering. In addition to
17 this, I've had various short courses, one, two and four week
18 courses in various subjects, including Industrial Hygiene
19 subjects.

20 Q Are you a member of any Professional Societies?

21 A I'm a member of American Industrial Hygiene
22 Association.

23 MR. DE SHAZO: Your Honor, Mr. Steart informs me
24 that he is familiar with this man and we can certainly
25 rely on his expertise, if this will help.

1 JUDGE DIXON: Are you satisfied with his qualifications
2 as an expert witness, Counselor?

3 MR. DE SHAW: Yes.

4 MRS. MC KEE: Then we'll skip that line of
5 questioning.

6 Q (By Mrs. McKee) Could you describe briefly the
7 Safety Program that Western Electric has at its Kansas City
8 works?

9 A Western Electric has an extensive safety program,
10 which is probably among the best in the Country, in the Kansas
11 City area. We have at the present time about 4,700 people in
12 the plant and for this group of people we have three people
13 working full time strictly in safety administration, safety
14 programs. We have two people, including myself, working in
15 Industrial Hygiene. We have three Plant Inspectors whose
16 responsibility it is to inspect new equipment before it goes
17 into operation to make sure it is in safe condition for the
18 employees to operate.

19 In addition to this, they in the safety organization
20 themselves do periodic inspections of the plant and various
21 portions of the plant to make sure that it stays in safe
22 operating condition.

23 Also, we have safety training programs. We have
24 safety meetings of the various operating organizations.

25 Q How frequently are those safety meetings held?

1 A An operating organization, it would be once a month.

2 Q Are those meetings of employees in the organization?

3 A Yes, employees at all levels. We have resources to
4 almost any equipment necessary to operate a satisfactory
5 safety program.

6 Q O.K. Turning your attention specifically to vinyl
7 chloride, what have you done with regard to any vinyl chloride
8 testing, monitoring, etc. at the Kansas City works?

9 A All right.

10 Q If you'll start first, before the Citation was
11 issued?

12 A As an Industrial Hygienist, my primary responsibility
13 is for recognition, evaluation and control of any aspect of
14 the industrial environment which might adversely affect the
15 health or wellbeing of either workers or neighbors of the
16 plant. And along those lines, it's my job to remain up to
17 date on the literature, what's going on in the field to make
18 sure that our employees are not harmed by any operation in the
19 plant.

20 Along these lines, vinyl chloride has been, what I'd
21 say--has been classified as hazardous material for a number of
22 years. Prior to the time the most recent interest in it, there
23 was a higher threshold level because we thought there was less
24 hazard involved. After they found out the possibility of
25 causing cancer, there became a heightened interest in it.

1 Both through my own resources and from the headquarters in
2 New York, we kept an eye on what was going on to see how it
3 affected our production and the Company as a whole, Kansas
4 City specifically. And we made sure we kept abreast of any
5 advances so that when any new information became available
6 we made sure we protected the individual from hazards. And
7 I would say vinyl chloride became of interest, oh, I'd say
8 maybe six months before the temporary standard came out. At
9 that time, our headquarters organization had broadly started
10 looking into it, contacting Industrial Hygienists at various
11 locations, starting running surveys and cross checks to see
12 exactly what occurrence of vinyl chloride and uses of poly-
13 vinyl chloride were within the Company and the possibility of
14 hazard to the employees.

15 At this time, they began looking into analytical
16 methods for checking the atmosphere and also at that time they
17 decided to turn over to the Engineering Research Center at
18 Princeton a charter to come up with a good analytical method
19 for checking vinyl chloride in the field.

20 Also, as I say, primarily my interest is in the
21 health of the individual and secondarily in any regulations
22 that might be involved.

23 So I would say the first indication of problems with
24 vinyl chloride was in the polymerization where the vinyl
25 chloride was taken in, polymerized, either produced or poly-

1 merized to polyvinyl chloride. Then sometime later they
2 began questioning the vinyl chloride that was released from
3 the polyvinyl chloride resin. And then the Company as a whole
4 began looking at these operations.

5 Q What did you find specifically in Kansas City, if
6 anything, before the inspection?

7 A We found that the Kansas City people did not use
8 vinyl chloride as a raw material and that we did not use
9 polyvinyl chloride resin as a raw material. We did have
10 polyvinyl chloride that had been changed from the polyvinyl
11 chloride resin to what we called a fabricated product of some
12 type.

13 Q Did you make any tests on those products before
14 the inspection by the Government?

15 A Yes. We started making tests; actually, I have the
16 date here, maybe the early part of May.

17 JUDGE DIXON: What year, sir, 1974?

18 THE WITNESS: 1974.

19 JUDGE DIXON: The year of the standard?

20 THE WITNESS: Yes, the year of the standard.

21 And this was, as we thought at the time, more
22 for our information than anything because what had been
23 in the literature did not lead us to believe a hazard^{was}/in-
24 volved in it. And also, from the indications from what
25 was in the standard, we did not feel that we were under

1 the standard. We began making tests and we picked what
2 we considered to be the operation in the plant which
3 might produce the most vinyl chloride, which was the
4 welding operation where sheets of PVC were welded to-
5 gether to make exhaust ducts.

6 Q (By Mrs. McKee) What was the result of your
7 sampling or testing?

8 A We pooled the samples here. What we were trying to
9 find was not where, we were more interested in what the
10 employee was exposed to and what--say the amount--amount he
11 was exposed to and our interest went to the maximum amount he
12 could be exposed to. This gives us a factor of safety and so
13 we check this.

14 MR. DE SHAZO: Your Honor, I'm going to object to
15 these results as being , in the one instance, hearsay
16 because there is no foundation as to the accuracy of the
17 results or who did the analysis on them. And further as
18 being immaterial because they are not part of the
19 contested--

20 JUDGE DIXON: I feel two ways about it. I think
21 you ought to narrow the question into the area involved.
22 This is sort of a preliminary background, I understand
23 and I am accepting it as such.

24 And if you could develop what methodology was used
25 in testing as to the potential vinyl chloride exposure.

1 In other words, you have not been cited for other
2 areas. I think he can make a general statement and I'm
3 going to allow him to testify as to background what
4 area was checked and what methodology was used to arrive
5 at the best results. I just don't think she got to that
6 question.

7 MRS. MC KEE: I haven't really reached it. This is
8 by way of preliminary.

9 JUDGE DIXON: I'm going to let her continue.

10 Q (By Mrs. McKee) Would you tell us first what
11 methodology was used to get these results you were about to
12 tell us about?

13 A For instance, as I say, Jim is one of the men who
14 worked in there, developed a method, which was somewhat
15 similar to the one Al Stewart has described, whereby a sample
16 of carbon of this particular type was placed in a stainless
17 steel tube and sealed at both ends and shipped in the tube
18 to the Industrial Hygienist in the field.

19 These tubes then used to obtain samples were placed
20 into pumps of various types.

21 Q Could I interrupt a minute? I am showing you an
22 Exhibit which has been marked Respondent's Exhibit No. 1.
23 Could you identify what that is, please?

24 (The document above-referred to
25 was marked Respondent's Exhibit

1 R-1 for identification.)

2 A This is essentially a sketch of the tube, stainless
3 steel tube, we're talking about that we used to trap the samples.

4 Q Could you explain what the black shaded area is?

5 MR. DE SHAZO: Your Honor, I'm going to have to
6 object unless this is an example of the tube that the
7 Company uses to run tests of the specific area that's
8 involved in the contest today. Then I think it's relevant.
9 If it's for the general method of testing, then I don't
10 think it's relevant to the issue before us; that is,
11 whether they tested or monitored this particular opera-
12 tion.

13 MRS. MC KEE: Let us withdraw that question. Could
14 we go off the record for a moment?

15 JUDGE DIXON: Right.

16 (Discussion off the record.)

17 JUDGE DIXON: Back on the record.

18 MRS. MC KEE: Thank you.

19 Q (By Mrs. McKee) Did you receive results from the
20 tests that you took?

21 A Yes.

22 Q Did you do anything based on those results? Did
23 you take any action yourself?

24 A No, we took no action.

25 Q Why did you not take any action?

1 A Because the results were in the parts per billion
2 range.

3 Q O.K.

4 A That's about 1/1000 of a part per million.

5 Q You heard Mr. Stewart testify this morning about
6 his inspection of the Western Electric facility. Without
7 going into it in detail, is his testimony substantially the
8 way you remember it, the inspection?

9 A Yes. There is only one item that is a recollection
10 of mine somewhat in disagreement.

11 Q What's that?

12 A When we went to my desk, he looked at--what he
13 looked at was not a list, particularly a list of raw
14 materials used in production, but a list of hazardous
15 material data sheets which we had collected in our organiza-
16 tion; this was from various suppliers supposedly describing
17 hazards of use of many of the chemicals we used in the plant.
18 And from that computer list, which we had mainly to keep track
19 of these, I had to go to my files and pull out the particular
20 hazardous material data sheet which was supplied us by the
21 supplier listing hazardous materials, and various information
22 on the use of the chemical materials.

23 Q Do you recall going through your file that day and
24 getting out the data sheet?

25 A I believe we did.

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1 Q How did that data sheet get into your file?

2 A It gets into my file by our organization, either my
3 co-worker or myself initiating in a letter to the supplier
4 asking for a hazardous data sheet on their material.

5 MRS. MC KEE: Would you mark this R-2, please?

6 (The document above-referred to
7 was marked Respondent's Exhibit
8 R-2 for identification.)

9 Q (By Mrs. McKee) You've just been handed what has
10 been marked for identification as R-2. Can you tell me what
11 that is?

12 A Yes. This is the cover letter and the Material
13 Safety Data Sheet which was supplied us by Hysol, which is
14 the manufacturer of the material in question.

15 One reason we did call the supplier is when we
16 looked on the middle of the first page, the sheet says, "No
17 hazardous ingredients".

18 Q This is the sheet you remember pulling out of your
19 file when Mr. Stewart came to visit?

20 A Yes.

21 Q Why is it that this cover letter is addressed to
22 V. Randle and not you?

23 A V. Randle is the buyer. Western Electric likes to
24 have their correspondence with buyers to go through the pur-
25 chasing organization to avoid getting into contractual

1 difficulties.

2 Q O.K. I would like this introduced into evidence.

3 MR. DE SHAZO: I have no objection.

4 JUDGE DIXON: This will be admitted. This is R-2.

5 Did you offer R-1?

6 MRS. MC KEE: No, I haven't. I'll offer it another
7 time.

8 (The document above-referred to,
9 heretofore marked Respondent's
10 Exhibit R-2, was received in
11 evidence.)

12 Q (By Mrs. McKee) When you went--

13 MRS. MC KEE: We have three pictures we want to
14 mark R-3, R-4, R-5.

15 (The documents above-referred
16 to were marked Respondent's
17 Exhibits R-3, R-4 and R-5
18 for identification.)

19 Q (By Mrs. McKee) All right. Could you tell me
20 what these three pictures represent and who took them?

21 A I took the pictures. And the pictures are of the
22 dip tank which has been referred to by Al Stewart. Picture
23 No. 1--

24 Q Let's talk about them in terms of R-3, R-4 and
25 R-5. There is marking on the back. Let's start with R-3?

1 MR. DE SHAZO: I have no objections.

2 JUDGE DIXON: It will be admitted.

3 (The object above-referred to,
4 heretofore marked Respondent's
5 Exhibit R-6, was received in
6 evidence.)

7 Q (By Mrs. McKee) There has been some discussion
8 here today as to how this coating process is actually carried
9 on. Could you describe it for us using the necessary Exhibits
10 R-3 through R-6?

11 A O.K. The process involves a rack which has about
12 the same dimensions as the surface of the tank which has
13 49 clips fixed to it so they hang. It is down from the level
14 rack--

15 Q You mean the coils hang down?

16 A I mean the clips hang down and the coils are then
17 clipped on the clips by the wire. So when you load the rack,
18 you have the 49 coils hanging down from the middle jig so
19 that the coils are all approximately the same level.

20 O.K. The rack and the coils are placed into an
21 oven at approximately 360° Fahrenheit and allowed to come to
22 temperature.

23 Q May I interrupt a minute? Is that oven vented in
24 any way?

25 A That oven is exhausted from the building.

1 Q O.K. What was your testimony as to how hot the oven
2 was?

3 A 360° Fahrenheit. After it comes to temperature,
4 the operator, wearing safety glasses and probably asbestos
5 gloves, reaches into the oven and pulls the rack out with the
6 coils and then places the rack in the jig above the tank and
7 lowers the hot coils into the Hysol material.

8 Q I have a little further testimony later on as to
9 what this Hysol material is.

10 A And then the rack and coils are lifted out of the
11 material and blown off with the arrows which can be seen
12 hanging in front of the table on the previous picture. Then
13 the rack is picked up and set back into the oven for five
14 minutes approximately at 360° Fahrenheit and then brought
15 back out and allowed to cool in the area.

16 JUDGE DIXON: How long is the coil immersed in this
17 coating, while this coating process is taking place?

18 THE WITNESS: Not very long, just about long enough
19 to allow it to cool, about a minute or two.

20 JUDGE DIXON: When they set the hot coil into the
21 material, how long does it remain in the material?

22 THE WITNESS: 20 seconds.

23 JUDGE DIXON: 20 seconds?

24 Q (By Mrs. McKee) Let's explore a little more in
25 detail what the material is. In this tank labeled polyvinyl

1 chloride, you mentioned it was Mysol. Can you explain what
2 that is?

3 A It's a Mysol material. We buy it from the Mysol
4 Company. It is Code Number CG7-4331. We contacted Mysol and
5 asked them what the exact makeup of it was and then at that
6 time they told us it consists of approximately half and half
7 a liquid. Half of it is a liquid and half of it is a solid.

8 Q When you say we, is that when you and Mr. Stewart
9 called the Mysol people?

10 A We called them and talked to them at that time. I
11 had subsequent conversations with them; it may have been all
12 during that conversation and some of it may have been later.
13 I'm really not positive.

14 Q So your testimony again, you say it contains?

15 A It contains--well, the solid part of it is PVC
16 material, polyvinyl chloride. And the liquid contains, is
17 made up of approximately 2/3 dioctyl phalate and 1/3--

18 JUDGE DIXON: Would you spell that for the Court
19 Reporter, please?

20 THE WITNESS: D-i-o-c-t-y-l, Phalate is P-h-a-l-a-
21 t-e.

22 O.K. And 1/3 of Rohm and Haas G-60 ester.

23 Rohm and Haas is a Company. It is two words, R-o-h-m
24 and H-a-a-s. G-60 ester; e-s-t-e-r.

25 In addition to this, it had small amounts of

1 proprietary additives that they add to the material to
2 give it special characteristics which they don't want to
3 tell anyone because it is their trade secret.

4 Q (By Mrs. McKee) How does the Hysol get into our
5 plant?

6 A We buy it or order it and it comes into the plant
7 in one gallon snap top cans. Normally, it would be shipped
8 by any method.

9 Q Where are they stored in the plant?

10 A First they would be stored in the chemical area
11 along with all the chemical supplies which is a four room
12 area in the plant where all chemical raw materials are stored.

13 And when the operating line needs them, they are
14 requisitioned from the chemical stores and the cans are
15 delivered to the operating line. At that point, they are
16 stored in the cabinet directly across from the dip tank.

17 Q How does the Hysol get from those stored cans?

18 A They are opened and poured into the tank.

19 Q Who opens them and pours them into the tank?

20 A One of the line operators.

21 Q How often is that done?

22 A It won't be done very often.

23 Q Can you qualify that in any way?

24 A Well, at the present time, they are only running the
25 operation about once a month so it wouldn't be any more

1 frequent than once a month, probably not that often, maybe
2 once every three months.

3 JUDGE DIXON: Is that one day a month?

4 THE WITNESS: Well--

5 JUDGE DIXON: One day out of a 20 day work month?

6 MR. DE SIAZO: I assume since the witness had to
7 look it up, he's not speaking from direct knowledge.

8 MRS. MC KEE: I believe he is. In fact, I was
9 about to ask him to give me his book.

10 THE WITNESS: Is it in that memo?

11 Q (By Mrs. McKee) And the question, Gene, is, are you
12 speaking from your own knowledge or if you had to refresh
13 your recollection by looking at your notes? I believe you
14 knew that of your own knowledge, but you should answer.

15 A I wrote these notes.

16 MR. DE SIAZO: I wouldn't object to it anyway. I
17 just wanted to be clear whether this is your own
18 knowledge?

19 THE WITNESS: No, I don't go down and watch them
20 pour it in every time they pour it into the tank. This
21 is information that comes through the Section Chief.

22 Q (By Mrs. McKee) Have there been any employee
23 complaints about this process?

24 A No, not that I know of, not that the Section Chief
25 knows of.

1 Q How do you know that the Section Chief doesn't
2 know of any?

3 A I asked him.

4 Q And he told you no?

5 A No.

6 Q How many employees actually perform the process?

7 A One.

8 Q And did you check this particular process before Mr.
9 Stewart came to the plant?

10 A No.

11 Q Why didn't you?

12 A First, my job as Industrial Hygienist is to protect
13 the employees and primarily that's my job. Meeting regula-
14 tions would be a minor portion of the job; consequently with
15 a chemical such as vinyl chloride or any chemical where there
16 is hazard involved, I review the chemical; I review our
17 operations in the plant. And first I have to decide how
18 hazardous the operation is and how likely to cause any
19 adverse effects on the health of the people in the plant.
20 And after more or less reviewing this, which would include
21 how hazardous the material is, how many people are using the
22 material, what is the possible level of exposure, what's the
23 frequency of the exposure and then we go on from there to
24 decide what steps should be taken to protect the employees
25 of the plant.

1 As I say, when vinyl chloride comes up, both
2 Company wide and locally, we start looking at the uses of
3 vinyl chloride, polyvinyl chloride and which ones could
4 possibly constitute a hazardous operation. One of the points
5 we have to consider is frequency and level of exposure.

6 For instance, this temporary standard was split up
7 into two parts. The scope and application says that, "This
8 applies to any area or operation in which vinyl chloride
9 (chloroethene), Chemical Abstracts Service Registry Number
10 75015, is manufactured, reacted, handled, processed, released,
11 repacked, or stored." Released--O.K. "Released" in this
12 wording is what we are interested in in figuring the hazard
13 to the employee.

14 For instance, if you have a piece of polyvinyl
15 chloride here, either in a completed product or in a raw mat-
16 erial, it's continually releasing some vinyl chloride. It may
17 be only a molecule a week, but it is releasing it.

18 So then, if we have these materials around, we have
19 to decide how fast they're releasing it or what is the prob-
20 ability of concentrations of vinyl chloride in the air, and
21 dig out those operations which we feel could constitute a
22 hazard to the employees and then, if it's on a basis of worst
23 first, or those which constitute a hazard to employees, we
24 start checking these things.

25 Q So what did you do here?

 A In this situation, I had two factors involved. Before

1 the standard came out, we started looking at vinyl chloride
2 and, as I say, we had no vinyl chloride in the plant and no
3 polyvinyl chloride resin. These were the items which had
4 been indicted as causing a hazard to individuals.

5 Now the polyvinyl chloride resins are in use in the
6 Company and I began to get information on release levels, and
7 this type of thing, on that. And to give you some idea on
8 what the quantities in the air were around these--to give you
9 some idea what the areas were with relation to the application
10 of the standards and the literature that had been published, I
11 did not think it applied to any operations that we had in
12 our plant.

13 Q Specifically why did you think that?

14 A Well, O.K. From the information that was published
15 as constituting a possible hazard to employees, the operations
16 that had been indicted were handling vinyl chloride, the poly-
17 merizing of vinyl chloride, and possibly the changing of a
18 polyvinyl chloride resin into some other form; either extruding
19 it into sheets or some other operation of the polyvinyl chloride
20 resin.

21 As I say, in our plant we had no vinyl chloride raw
22 material. We had no polyvinyl chloride resin raw material.

23 Q O.K. That's the reason you did not monitor?

24 A O.K. The reason we did not monitor this particular
25 operation--frankly, it didn't come to mind to me when we made

1 the survey as being one that there was any hazard at all in-
2 volved in.

3 But we did come to monitor a couple of other opera-
4 tions which we thought had head involved which we thought
5 might possibly release a vinyl chloride but even this we did
6 not think was a hazard. But we wanted to test them to see what
7 levels we were talking about.

8 Q O.K. After Mr. Stewart came in and made his in-
9 spection, did you have occasion to make some of your own
10 tests?

11 A Yes, he came in, made his tests and I was somewhat
12 floored by the results. But after that, we went ahead and
13 made this.

14 Q Would you explain what you mean by you were floored
15 by the results?

16 A The results as he mentioned that we first got from
17 him were that he pulled a sample inside the tank. One reading
18 read two parts per million, which was the second reading in-
19 side the tank. The first reading inside the tank was a
20 parallel sampling with an operator which he mentioned was
21 sitting about six feet away. Both of these were reported as
22 being less than two parts per million which to me at that
23 time meant that they were approximately the same readings,
24 somewhat less than two parts per million, but significant and
25 the same. So I was rather surprised that he got a level of

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1 of the stainless steel tubes and then you take them to the
2 laboratory and you use the hand pump to pump 200 milliliters
3 of dry nitrogen through the tubes, as the laboratories
4 recommend, to make sure that any moist air is flushed out.

5 Q I forgot to ask you exactly where you took these
6 samples?

7 A We took a number of samples.

8 Q Let's start with the samples you took on June 11.

9 A June 11, I took two samples in a row. The picture
10 here shows the pan right beside the tank and there is a
11 stirring paddle that they stir the plastisol with to keep it
12 stirred up, which you can barely see it there in one of these
13 pictures.

14 Q I think all three you can see it in the back.

15 A Two samples were taken approximately two inches
16 from the liquid in the bread pan. A sample was taken from
17 the dip tank on the left side with the lid closed. A sample
18 was taken from the dip tank on the right side with the lid
19 closed. A sample was taken in the breathing zone eighteen
20 inches over the lip of the tank.

21 In addition, we had a blank.

22 Q Did you label your samples in any way on June 11?

23 A We labeled with numbers.

24 Q Could you identify what number you put for each
25 one of these places?

1 A Yes. We labeled them "A", "B", "C", "D", "E", and "F".

2 Q In the same order that you just testified?

3 A Yes.

4 Q O.K. Now what about your samples on June 25?

5 A O.K. There were four samples taken on June 25.

6 One was in the breathing zone.

7 Q Could you define exactly where that would have been?

8 A The breathing zone would be about the point where
9 the operator would be if he were standing over an open tank
10 working the operation.

11 Q Where was that in this case?

12 A It would be about 18 inches above the front lip of
13 the tank with the tank open.

14 We also took analysis of the cooling where the coils
15 were cooled later on. Also, the breathing zone of the
16 operator next to the hot coils and there was a blank involved
17 in this. And they were labeled "1", "2", "3", and "4".

18 Q And then you also said you sent some of the actual
19 Mysol solution to the laboratory?

20 A Yes.

21 Q What kind of container did you put that in? Where
22 did you get the Mysol from?

23 A It came out of the tank; plastic vial.

24 Q You put it into a plastic vial?

25 A (Nods affirmatively.)

1 Q On both June 11 and June 25, could you tell me what
2 you did with the carbon tubes and how you actually sent them
3 to Princeton's laboratories---I'm sorry--the
4 and how you---

5 A We just capped them with the plastic caps and sent
6 them to Princeton.

7 Q Did you address them to anyone specifically?

8 A Well, I don't know. It would be to the attention of
9 Mr. Jim Rasmussen or Mr. Racco (phonetic), a co-worker of his.

10 Q I'm sorry. I missed that. You said that on June
11 25 you sent along one blank?

12 A On both dates we did.

13 Q Do you know what the blank was labeled on the June
14 11th analysis?

15 A Yes.

16 Q Now in that area where you did your sampling, do
17 you have any indication of other hydrocarbons in the air
18 other than vinyl chloride?

19 A In the area of the tank, as Al mentioned, backs up
20 to a chemical hood which they are doing other potting opera-
21 (phonetic)
22 tions, both with proxies/and chemicals; consequently, there
23 is quite a number of organics in the area. In addition to
24 the potting materials, there could be solvents of the various
25 types used for cleaning the equipment or cutting the materials.

MRS. MC KEE: I'd like to move that R-1 be intro-

1 the second section down here it says "Hazardous Mixtures of
2 Other Liquids, Solids or Gases" and they have written "No
3 hazardous ingredients." By that, did they mean that there
4 was no hazardous ingredient in the material other than
5 polyvinyl chloride or other than polyvinyl chloride there is
6 nothing in there that they think is hazardous?

7 A There was nothing that they thought was hazardous
8 in the material including the polyvinyl chloride.

9 Q But in Section I, they do say it is polyvinyl
10 chloride?

11 A That's right.

12 Q Of course, this letter was sent to you, this
13 material was sent to you, on August 28, 1973, at least six
14 months before the Standard was published?

15 A That's right. Now polyvinyl chloride is still not
16 listed as hazardous material.

17 Q This material does include dioctyl phthalate though?

18 A Yes.

19 Q That is a hazardous material, isn't it?

20 A I don't know offhand. I'd have to check. It may
21 be at some level.

22 Q In fact, it is at a lower level than polyvinyl
23 chloride in the Emergency Temporary Standard?

24 A Dioctyl phthalate--

25 Q I'm thinking of the polyvinyl chloride as a TLV, or

1 a ceiling limit actually, of 50 parts per million and under
2 the Temporary Emergency Standard and dioctyl phthalate has an
3 even lower TLV than 50 parts per million, doesn't it?

4 A I would have to check that. I don't remember.

5 Q But, at any rate, they were basing the information
6 on this sheet on knowledge gained at least prior to August
7 28, 1973?

8 A Yes. Now this sheet is one now that OSHA has
9 recommended we obtain on all materials used in our operations.
10 I'm not sure even, though, that the information that we get
11 from our suppliers is perfect. It is simply one piece of
12 information of many that we use in evaluating the hazards
13 on a job.

14 An industrial hygienist won't accept any one piece
15 of information in evaluating a hazard on a certain job;
16 not even the chemical analysis. He cross-checks that to
17 make sure it's logical.

18 Q You made the statement that polyvinyl chloride is
19 continually releasing VC, is that correct?

20 A That's right.

21 Q So that coil that is sitting in front of you that
22 is coated with polyvinyl chloride is releasing VC into this
23 room right now, is that correct?

24 A Yes.

25 Q All right.

1 A My problem is, as an Industrial Hygienist, when a
2 standard of this type comes in as to what level--

3 MR. LAMAR: I object to this. If Counsel wants
4 to pursue it--

5 Q (By Mr. DeSaazo) Then the Hysol is releasing vinyl
6 chloride into the atmosphere in and around that tank, isn't
7 it?

8 A Yes.

9 Q Without question?

10 A Yes.

11 Q You also made the statement that there was no
12 vinyl chloride in the plant. Did you mean none prior to when
13 Mr. Stewart was there?

14 A What I said was, we do not use vinyl chloride as a
15 raw material. That is, we do not buy something that is
16 labeled vinyl chloride and bring it into the plant.

17 Q But there is vinyl chloride in your plant, obviously,
18 as you have just stated it is being released in the atmos-
19 phere?

20 A Well, there is probably one molecule of almost
21 everything you might want in the plant.

22 Q But the point is, there is vinyl chloride out there?

23 A Oh, yes.

24 Q Now the polyvinyl chloride in the Hysol is--it
25 is in suspension. Is it a resin in suspension?

1 A Well, it's a plastisol. It would be a resin in that
2 it's a type of suspension. If you want a definition of a
3 plastisol--

4 Q Well, the PVC itself as it's in that product is a
5 resin though, isn't it?

6 A Yes.

7 Q As it is suspended in the plasticide, it is a resin?

8 A Yes.

9 Q So you were saying there was no vinyl chloride or
10 polyvinyl chloride in the plant?

11 A We do not buy polyvinyl chloride resin as a raw
12 material.

13 Q And, of course, raw material as you've been using
14 it from the start of your testimony as a conclusion on your
15 part--you're trying to make a legal conclusion as to whether
16 it's a raw material or not. But the fact is that you do have
17 vinyl chloride and polyvinyl chloride resin in your plant, and
18 that you are releasing vinyl chloride into the atmosphere in
19 your plant at this very minute just as you were the very
20 minute that Mr. Stewart was out there making his inspection?

21 A I have to make a legal conclusion as an Industrial
22 Hygienist in applying standards to our plant. It's not
23 legal, of course, but an interpretation of legal documents
24 such as the standard.

25 Q Is there any substance other than Hysol that

1 Q Yes. Do you put them on yourself?

2 A They put them on before they send them to us.

3 Q It does have the sticker on there, or flag?

4 A (Nods affirmatively.)

5 Q Using Exhibit R-1, where is that place?

6 A You can't use that Exhibit. The tube's about 7 1/2
7 inches long. It's normally about an inch and a half far
8 enough back to be out of the way, far enough towards one end
9 to be definitely on an end.

10 Q Where does this red end go?

11 A It goes on the outboard end, if you pull a sample
12 through.

13 Q O.K. You stated, and rightly so, that your
14 primary concern was with the health of the employees that
15 work at Western Electric and your secondary concern was with
16 compliance with the standard?

17 A Yes, right.

18 Q However secondary as it may be, it's still--it's a
19 concern of yours to make sure that Western Electric is in
20 compliance with the standards?

21 A That's right.

22 Q And you were aware, I presume, of the vinyl chloride
23 standard which has been offered into evidence?

24 A That's right.

25 Q And you were aware also of the preamble to it set

1 resin which is the polymer of vinyl chloride --

2 Q As you just stated, vinyl chloride and the polyvinyl
3 chloride are present in your facility?

4 A No, not, as per se, as vinyl chloride or as poly-
5 vinyl chloride that we have obtained and brought into the
6 plant. It's there as part of a fabricated material.

7 Q You just told me, didn't you, that vinyl chloride
8 is being released off that little plastic object there and
9 the vinyl chloride is being released as vinyl chloride. It
10 is not a polymer or a copolymer. It's not any kind of sub-
11 stance other than vinyl chloride?

12 A That's right. Consequently, on that basis, we do
13 have vinyl chloride in the plant and mixed in the fabricated
14 product of Hysol we do have a polyvinyl chloride resin. But
15 we do not purchase something called vinyl chloride or poly-
16 vinyl chloride resin and bring it into the plant.

17 Q When Mr. Stewart was there, you say this is the
18 sheet you had at the time he was there and you showed it to
19 him?

20 A I believe so. I'm not--

21 Q If you had this sheet in front of you at that
22 time, you did call this Mr. Hornberg, is that correct?

23 A Yes.

24 Q What would be the purpose of calling him if you
25 had the information before you?

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3 chloride are present in your facility?

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6 plant. It's there as part of a fabricated material?

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8 is being released off that little plastic object there and
9 the vinyl chloride is being released as vinyl chloride? It
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13 have vinyl chloride in the plant and mixed in the fabricated
14 product of Hysol we do have a polyvinyl chloride resin. But
15 we do not purchase something called vinyl chloride or poly-
16 vinyl chloride resin and bring it into the plant.

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18 sheet you had at the time he was there and you showed it to
19 him?

20 A I believe so. I'm not--

21 Q If you had this sheet in front of you at that
22 time, you did call this Mr. Hornberg, is that correct.

23 A Yes.

24 Q What would be the purpose of calling him if you
25 had the information before you?

1 A The information we get from suppliers is not gospel.
2 It has to be taken with a grain of salt. That was the only
3 information; it wasn't satisfactory on the basis and in the
4 light of the name on the tank.

5 Q At the time that you and Mr. Stewart--you may not
6 recall this from direct this morning and if you don't recall
7 exactly, as I understand it, Mr. Hornberg told you that he
8 really didn't--wasn't able to give you any satisfactory
9 description of what was in the product at that time?

10 A I wouldn't remember exactly. I remember talking to
11 two men from Hysol and there may have been, I guess, four or
12 five different calls over the course of about a month there.
13 I'm not sure what information we gained in that one call.

14 Q I'm not sure that these pictures adequately show
15 it, but there is no ventilation for a hood of any kind over
16 this particular tank, is there, to exhaust it?

17 A Just general ventilation.

18 Q Just general ventilation? There's nothing specif-
19 ically designed to this particular tank at all?

20 A No.

21 Q When you--let's take your two samples here, the
22 one on June 11 first, when you took that sample, it took you
23 just a few minutes to take the sample?

24 A (Heads affirmatively.)

25 Q How long then did you wait until you pulled the

1 you send them by regular mail or did you have any way of
2 knowing when the samples were received by them.

3 A We did not record it, we would call in a few days
4 and find out if they got them. We have a coronet line, a
5 regular telephone line. I'd just pick up the phone on my
6 desk and dial it direct and ask. I didn't record it.

7 MR. DE SHAZO: I think it is marvelous, the tele-
8 phone connections that Western Electric has. I have no
9 further questions.

10 MRS. MC KEE: I just have a couple of redirect.

11 REDIRECT EXAMINATION

12 BY MRS. MC KEE:

13 Q Would you tell me again what kind of pump you used
14 to pull these samples, a Mine Safety Appliance Pump, is that
15 a hand pump?

16 A Yes, a hand pump.

17 Q Is that the MSA hand pump?

18 A Yes. MSA is an abbreviation for Mine Safety
19 Appliance.

20 Q Did you ever find out what levels of PVC are
21 contained within the plastisol material?

22 A In our communications with Hygel, I got a letter
23 from Jim Hornberg dated June 25 in which he sent me a copy
24 of a letter from B. S. Goodrich Chemical Company, dated
25 June 4, and Mr. Hornberg told me that he used 120 Series

1 Dispersion Grade Resin in making the CG7-4331. And from the
2 Goodrich letter, they state that the average amount of
3 residual monomer in this resin is less than 25 parts per
4 million.

5 Q Did you ever have occasion to check that further?

6 A No.

7 Q There's one thing I forgot on direct, I'm sorry,
8 but I think it will make it easier later. Could you mark
9 this please? We are on R-7.

10 (The document above-referred
11 to was marked Respondent's
12 Exhibit R-7 for identification.)

13 Q (By Mrs. McKee) Mr. Wilner, could you identify
14 R-7 for me, please?

15 A Oh, yes, this is a summary of the results of the
16 analyses--

17 Q I don't want you to go into the results, but
18 earlier you testified that your samples were labeled in a
19 certain way and corresponded to the places in the plant
20 where you took your samples?

21 A Yes.

22 Q Would you review Table 1 and Table 3 on R-7 and
23 tell us if that is the way you labeled your samples and
24 those are the places where you took the samples that
25 correspond?

1 A It is essentially the way they are labeled.

2 Q What additions or amendments would you make?

3 A Samples "A" and "B"; that is, "IWC dip bread pan,"
4 where the paddle was set and the "F" is in actuality a blank.

5 Q Did you label the blank?

6 A No.

7 Q Then on Table 3--I'm sorry.

8 A Yeah, that's it.

9 MRS. MC KEE: I don't intend to offer this exhibit
10 at this time as it contains other information.

11 JUDGE DIXON: This would be a good time for a short
12 break.

13 (Witness excused.)

14 (Short recess.)

15 JUDGE DIXON: Back on the record.

16 (The documents above referred to
17 were marked Respondent's Exhibits
18 Nos. R-8 through R-19 for i-
19 dentification.)

20 MRS. MC KEE: We call Mr. Rosenbaum.

21 Whereupon,

22 JIM ROSENBAUM

23 was called as a witness by and on behalf of the Respondent
24 and, having been first duly sworn, was examined and testified
25 as follows:

DIRECT EXAMINATION

BY HON. MC KEE:

Q Please state your name.

A Jim Rasmussen.

Q Mr. Rasmussen, where are you employed?

A I work for Western Electric Company, Princeton, New Jersey, at the Engineering Research Center.

Q Could you describe quickly for us what the Engineering Research Center is?

A No, not very quickly but I'll answer the question quickly anyway.

The Engineering Research Center is supposed to serve as a bridge between Bell Telephone Laboratories and Western Electric. It doesn't always work out this way. The Engineering Research Center is composed of about 100 professionals. Most of them have their Doctorate Degrees and generally work on bringing new technology to bear in manufacturing systems in manufacturing situations throughout the company.

Q Can you describe what you do at ERC?

A Yes. I've been a member of the Environmental Characterization Group at the Engineering Research Center for approximately two years. Recently, the name of the group has been changed but we have still been doing some environmental work.

Q O.K. Can you give us--can you tell us what your

1 educational background is?

2 A Yes. I have a Ph.D. from Iowa State University,
3 and that's about it, in Analytical Chemistry.

4 Q Can you tell us what your prior work, job exper-
5 ience, has been?

6 A Yes. I worked for Bell Telephone Laboratories for
7 two years in Columbus, Ohio. I worked two years at Princeton.

8 Q O.K. Have you written any papers that would be
9 relevant to this case?

10 A Well, I've published approximately four papers in
11 the field of Analytical Chemistry. I've recently given a
12 talk in New York to the Society of Plastic Engineers on the
13 particular analytical technique that was used here in Kansas
14 City, and throughout the Company.

15 Q What do you mean when you say that?

16 A What do I mean when I say what?

17 Q What technique are you talking about?

18 A I'm talking about the technique for vinyl chloride
19 that we developed using traps.

20 Q O.K. When did you begin doing your research on the
21 vinyl chloride trap?

22 A Approximately February 1974.

23 Q What did you begin doing at that time?

24 A At that particular time the first thing we did was
25 we fed some traps containing Porapak Q.

JUDGE DIMICK: Would you spell that for the Court Reporter?

THE WITNESS: P-o-r-p-a-k Q, capital Q.

Our first attempts at developing vinyl chloride were merely based on previous experience. We'd been using this type of trap for trapping general organics out of the air for gas chromatograph-mass spectrometric analyses. And based on our previous experience with different organic compounds, we simply took these traps to the field and tried them out to see if we could detect any vinyl chloride.

As it turned out, we weren't too satisfied with this particular trap and subsequently developed the Carbosieve B Trap, which was shown in that first exhibit.

Q (By Mrs. McKee) O.K. You heard Mr. Widner testify that he sent you a number of samples, in two groups to be exact. They were trapped at the Kansas City works. Did you receive those samples?

A Yes, I did.

Q O.K. I'm going to ask you to explain your process of analysis and I want you to tell us whether or not the process that you've had to explain was the process that you used to analyze those samples that Mr. Widner sent you?

A I'll be happy to. The process that I'm about to explain is an analytical procedure that I used.

1 I should preface this by saying that I have a
2 technician or two who works for me and I did not personally
3 analyze these samples. The technician did.

4 Q Did he do that under your direction?

5 A He did this under my close supervision.

6 Q I've had the reporter number a number of exhibits.
7 They go up to R-19. And I'm going to hand them to the wit-
8 ness now and I'm going to ask him to identify them as he
9 explains this process to us. It's sort of an integral part
10 of his explanation.

11 JUDGE DINGEN: When you are referring to an exhibit,
12 call off the number.

13 THE WITNESS: All right.

14 Q (By Mrs. McKee) O.K. Would you explain your pro-
15 cess and I'll ask you more questions as you go along. I
16 think it would be easier to let you go ahead.

17 A Well, basically I'll try to attempt to describe
18 the sampling procedure. From the sampling, we bring these
19 tubes that you've already seen to the laboratory.

20 Q Would you identify the number of that exhibit?

21 A Yes, this is Exhibit R-1. We take the tubes, which
22 have been identified in Exhibit R-1, into the laboratory
23 where we perform a gas chromatograph/mass spectrometric analysis
24 on them.

25 Q Let's get more specific. Let's talk first about
R-1 and the tubes that are pictured there.

1 A All right. This tube contains four inches of
2 Porapak--rather of Carbosieve B which has been placed into a
3 stainless steel tube which is seven and a half inches long.
4 Two glass wool plugs hold the Carbosieve B absorbent material
5 inside this tube.

6 We've tested this tube extensively in the laboratory
7 and we find that it retains vinyl chloride very, very well.

8 In addition, NIOSH has tested Carbosieve B as a
9 trapping material and NIOSH has found that Carbosieve B re-
10 tains vinyl chloride to a greater extent than the charcoal
11 material that the Government used.

12 MR. DE SIAZO: Your Honor, I move to strike that
13 as nonresponsive to the question, as to what his procedure
14 is.

15 JUDGE DIXON: Stick to your procedure, if you will.

16 THE WITNESS: This is very, very pertinent to the
17 procedure because how well vinyl chloride sticks onto
18 the Carbosieve B trapping material is of utmost concern
19 to the analytical procedure.

20 JUDGE DIXON: Then you say in comparison with the
21 material; not with respect to people or places.

22 THE WITNESS: I wasn't. I was referring to the
23 material that was used.

24 JUDGE DIXON: Then the material--

25 THE WITNESS: The charcoal. This Carbosieve B is

1 MR. DE SHAZO: I have no objection.

2 JUDGE DIXON: It will be admitted.

3 (The document above-referred to,
4 heretofore marked Respondent's
5 Exhibit R-11, was received in
6 evidence.)

7 Q (By Mrs. McKee) O.K. Moving on to R-12, what
8 happens to the by-product of the last Exhibit, or the product
9 of the last Exhibit that has entered the column? Does that
10 fit into R-12 then?

11 A Yes, it does fit into R-12.

12 Q O.K.

13 A The released organic vapors from the trap enter the
14 gas chromatograph column at the position labeled on R-12, call-
15 ed "Sample" and you'll see an arrow there.

16 The vinyl chloride is then separated from other
17 organic materials in this column as has been described very
18 ably earlier in the day.

19 Q May I stop you a minute? Do you mean as far as the
20 gas chromatograph analysis goes, yours functions just like,
21 oh dear, Mr. Lucero's?

22 A The principals of the gas chromatograph are/those
23 which have been described previously. similar to

24 Q Then maybe you better go into it if it is only
25 similar. Could you describe how it differs and how you do

1 it particularly?

2 A It differs in that we use a different type of
3 analytical column than has been described previously.

4 Q How does our analytical column differ?

5 A We have two columns which are tied together inside
6 this gas chromatographic oven. We have four inches of an
7 (phonetic)
8 octane, Porcel C, followed by about fifteen inches of Porpak
9 Q--that is, if the analysis is carried out at about 70°
centigrade.

10 Q Does the kind of column that is used affect the
11 results?

12 A Yes, it does.

13 Q How does it affect the results?

14 A Based on which column is used, one can have dif-
15 ferent organic materials interfering with the analysis. If
16 a flame ionization detector is used alone--

17 Q Why did we pick the two columns that you just
18 testified to?

19 A We picked the two columns because we found that
20 these two columns separate vinyl chloride from all known
21 organic materials that we have at Western Electric in our
22 atmosphere.

23 Q O.K. Once the gas has gone through the gas chromato-
24 graph, I see that there is further processing involved.
25 Could you explain both parts of that further processing

1 which would be on R-12?

2 A Yes. We split the effluent from the gas chromatographic column into two parts. Part A goes to the flame
3 ionization detector.
4

5 Q How is that represented on R-12?

6 A This is represented by an arrow at the end of the
7 column pointing to the box labeled "FID" which stands for
8 flame ionization detector.

9 Q What does that process do?

10 A When an organic material enters a flame ionization
11 detector, we produce electrons and ions. These electrons and
12 ions are monitored electronically to produce a recording on
13 a strip chart recorder similar to that which has been
14 described earlier in the day.

15 Q Is that what happened here?

16 A That is what happened here.

17 Q Now the second part of the analysis, what does that
18 do?

19 A O.K. The rest of the effluent which doesn't go to
20 the flame ionization detector goes to the mass spectrometer.
21 The first part of the mass spectrometer consists of a device
22 called a molecular separator, labeled "separator" on R-12.
23 The separator consists of a glass frit in which the helium
24 carrier gas is pumped away leaving the organic molecules.
25 And these organic molecules can then enter the device known

1 Q You say it shows a single peak for vinyl chloride;
2 how do you know it is vinyl chloride, other than it is labeled
3 vinyl chloride?

4 A We know it is vinyl chloride due to two reasons.
5 It has the correct retention time of two minutes in this case.
6 And it has responded to the 62 ion of vinyl chloride.

7 Q O.K. Now this particular diagram is broken down
8 into M.S. 62 ion, which I guess means--what does that mean?

9 A That means that we have tuned the mass spectro-
10 meter to the 62 ion of vinyl chloride.

11 Q And M. S. stands for mass spectrometer?

12 A In this tense, mass spectrometer.

13 Q The lower one is labeled "F.I.D." What does that
14 stand for?

15 A That stands for flame ionization detector.

16 Q The two diagrams seem to be out of the phase. Can
17 you explain that?

18 A These two diagrams are in phase if you look at
19 the peak which corresponds directly below.

20 MR. DE SHAZO: ^IThe object ^{of} the question was can
21 you explain how come it is out of phase and he just said
22 it is in phase, so there is no further answer required.

23 Q (By Mrs. McKee) O.K. It appears that it is out
24 of phase. You said it is in phase. How is it in phase?

25 A It is in phase for the reason that if you look

1 directly below the peak that has an arrow drawn to it
2 corresponding to 0.040 ppm VC. In this case, we find vinyl
3 chloride. If we draw a line directly from the top of that
4 peak to the top of the peak right underneath there, which
5 consists of dots rather than a solid line, we will find an-
6 other peak. This is the flame ionization detector response--
7 for vinyl chloride in this case.

8 Q What is the flame ionization detector measuring in
9 the subsequent higher curve?

10 A The subsequent higher curve is a C₄ hydrocarbon
11 which we have identified mass spectrometrically.

12 Q How did you identify it?

13 A We identified it mass spectrometrically.

14 Q What did you identify it as?

15 A I have to qualify what I just said to be completely
16 accurate. I have identified a similar component with the
17 same retention time as this species. To the best of my
18 ability as a Mass Spectrometrist, I've identified a molecular
19 species which commonly has this retention time and is common-
20 ly found in this type of sample as the C₄ hydrocarbon.

21 Q How long have you been using this particular process
22 to test for vinyl chloride; to analyze for vinyl chloride
23 samples?

24 A I've been using this particular technique since
25 approximately the end of March 1974.

1 Q In that time, either before or since then, have you
2 had occasion to test its reliability?

3 A Yes, I have.

4 Q What kinds of tests, first of all, have you per-
5 formed?

6 A This is a difficult question to answer without
7 referring to some of the further Exhibits.

8 Q O.K.

9 MR. MC KEE: In the event I forgot to offer R-13,
10 I'd like to offer R-13 at this time.

11 MR. DE SWEET: Could I ask just one question.

12 VOIR DIRE EXAMINATION

13 BY MR. DE SWEET:

14 Q What do you mean by in phase or out of phase?
15 What do you mean by in phase? When she asked you if it--the
16 F.I.D. curve was in phase with the M.S. 62 ion curve, what
17 were you saying? What did you mean when you said they were
18 in phase?

19 A I meant that the--out of phase means that the
20 vinyl chloride peaks out at a different retention time for
21 the flame ionization detector as the mass spectro 62, but in
22 this, it's not the case.

23 Q The peak would be at the same time?

24 A It would have the same retention time.

25 Q So that what showed up on your gas chromatograph

1 Q What is the detection limit of this particular
2 technique? Could you describe this to us?

3 A O.K. If we define detection limit as being equal
4 to the signal--which is the signal generated by vinyl
5 chloride in the instrument which will give us a response
6 equal to twice the standard deviation of the base line--the
7 detection limit going directly into the gas chromatograph/
8 mass spectrometer, using a 5 milliliter sample loop--and
9 this is without the trap--is equal to one part per billion.

10 The instrumental detection limit, assuming a one
11 liter sample and diluting it off of one of our traps,
12 corresponds to five parts per trillion. But this has to be
13 qualified in that we cannot detect to the best of our
14 knowledge down to 5 parts per trillion.

15 This is only an instrumental response and it's
16 such a low level we would probably lose the vinyl chloride in
17 some plumbing or something.

18 Q How far; to what lower limit do you believe this
19 technique will go?

20 A I believe this technique is valid down to some
21 part per billion level.

22 Q Now one of the other things that is important is
23 how much vinyl chloride is desorbed from the trap and I
24 call your attention to R-15.

25 A That is correct.

1 We took quite a few traps and the one labeled on
2 this particular diagram refers to Carbosieve B trap. We
3 artificially placed known amounts--known quantities of vinyl
4 chloride onto the traps that are indicated to the left of the
5 dotted line and that is labeled by the work, "simulated".

6 Q Is that "simulated" with an arrow pointed to the
7 left?

8 A Yes, the arrow is pointed to the left. And on the
9 "X" axis down below this vicinity where it is labeled ".001"
10 part per million to 1 part per million, in that particular
11 approximate region.

12 We placed known amounts of vinyl chloride which
13 would correspond to the concentrations which are shown on the
14 "X" axis. If one had used either a half liter or a one liter
15 sample, I cannot remember which I assumed in this particular
16 calculation, but it is one of those two numbers, we then
17 analyzed these traps. After we passed a mixture of water
18 vapor and air--and I should say the air was totally saturat-
19 ed with water vapor--we passed approximately 500 milliliters
20 of this mixture at about 100 milliliters per minute through
21 these traps.

22 We then placed these traps into our gas chromatog-
23 raph mass spectrometer device and we analyzed them. And
24 as you can see from our R-16, the agreement between what we
25 expected we would get off the trap at the low concentrations

1 versus what do did get off the trap is very good. Perfection
2 would be if all the "X's" would lie right on a straight line.

3 Q Can you quantify the closeness of the results?

4 A Yes, I can.

5 Q How do you do that?

6 A Once again, to the left of this dotted line, the
7 relative standard deviation of the simulated samples from the
8 true values was 5.5 percent.

9 Q On the other side of the line?

10 A On the other side of the line, we used a slightly
11 different procedure. Rather than placing known quantities
12 of vinyl chloride onto the trap, we actually made real mix-
13 tures of vinyl chloride. And we placed--and we actually
14 used the sampling set up similar to that which we really
15 use in the field. And this is why the scatter of the points
16 is a little bit greater because we've got pumping errors
17 here. There are slight errors in measuring flow rates and
18 so on.

19 And so the points to the right of the line more closely
20 correspond to the real situation than the points to the left
21 of the line. And the relative standard deviation of the
22 points to the right of the dotted line divided by .8--we do
23 the same thing the Government does. We've got about 80 per-
24 cent efficiency. We've also got an 80 percent efficiency,
25 so we divide these values by .8. After we divide these values

1 Q (By Mrs. McKee) So back to Table 2, would you tell
2 me--well, first of all, did you sample the Hysol material,
3 whose results are reported in Table 2?

4 A Yes, I did. I had my technician with me and to-
5 gether we did this. I think I did most of the physical
6 manipulations. I may have had him hunting for a glass vial
7 for me and so on.

8 JUDGE DIXON: That's acceptable under the rule.

9 Q (By Mrs. McKee) How did you receive this material
10 from Kansas City, if you recall?

11 A It was sent in the mail to me by the Kansas City
12 personnel.

13 Q How was it packaged, if you remember?

14 A It was packaged in a glass container with a screw
15 top cover.

16 Q What did you do when you received the material?
17 What was the first thing you did?

18 A I probably set it on the shelf.

19 Q What is the second thing you did? O.K., you set up
20 some sampling conditions; under what conditions did you
21 sample the Hysol plasticol?

22 A I sampled the Hysol plasticol--and to be most
23 accurate, can I refer to my notes?

24 Q If you need them to refresh your recollection, yes.
25 If you can remember without them--

1 A I can remember without them. I placed the 50
2 milliliters of the Nysol material that was sent to me into
3 150 milliliter volumetric flask.

4 Q And what did you do with it?

5 A It's very difficult to describe what I did without
6 going to the platform. Am I allowed to do that?

7 JUDGE DIXON: You can't photograph it.

8 Q (By Mrs. McKee) Can you describe it? I'm sure
9 you can describe it.

10 A Well, I'll try to describe it. The helium carrier
11 gas was bubbled through the mixture. We physically had a
12 piece of glass rod going through the stopper into the
13 plastisol material. The helium--it was either air or helium
14 at this point, I can't remember which, the gas was bubbled
15 through the helium at a very slow, slow rate.

16 Q You say it was bubbled through the helium?

17 A I'm sorry, bubbled through the plastisol mixture.
18 And, I believe this slow rate of flowing through the plasti-
19 sol was on the order of between 15 and 30 milliliters per
20 minute based on my recollection. I'd give you a more
21 accurate number if I could refer to my notes.

22 This gas mixture was then sent to a 5 milliliter
23 gas sampling tube, which was attached to a gas chromatograph
24 mass spectrometer.

25 Q That's the device?

1 A This testing was done completely independent of traps.
2 This was a so-called direct analysis?

3 Q And what you attached it to was the device you
4 testified earlier to?

5 A Right. So what we've done here, is we have tested
6 the vapors over the Hysol plastisol mixture in a closed
7 container by a technique known as Head Space Analysis.

8 Q I'm a little confused on that. You call it Head
9 Space Analysis. Are you talking about bubbling the helium
10 gas actually through the mixture? Would you explain that a
11 little further?

12 A In true Head Space Analysis it's true you wouldn't
13 have the air or the helium bubbling through the mixture, you
14 would just be analyzing the head space of the solution.
15 However the volume of the container was enlarged with res-
16 spect to the flow rate, so in a sense, we were testing the
17 head space.

18 Q I see.

19 A This container, the 150 milliliter volume metric
20 flask, was placed into a beaker which contained water. We
21 then could control the temperature of the Hysol, the plasti-
22 sol mixture by heating the water.

23 Q O.K. And at what conditions--what other conditions
24 did you use--I see here one labeled "room temperature". Is
25 that the one you just described?

1 A Yes. Since we started our procedure, we switched
2 our gas sampling valve and we ran that analysis direct. Once
3 again, let me emphasize no trap was involved.

4 Q This first direct analysis, was that at room temper-
5 ature? Is that correct?

6 A Yes. Let me also emphasize that this was in the
7 mass spectrometer and not the flame ionization detector.
8 The results that we obtained at room temperature corresponded
9 to a nondetectable level. We estimated our detection limit
10 on that particular day conservatively at under 0.01 parts
11 one million was indicated in R-7.

12 Q What factors enter into your--the detection limit
13 being at that level on that particular day.

14 A The largest factor is that we were not using the
15 trap to concentrate the sample. We were sending the gas
16 directly into the gas chromatograph mass spectrometer. And
17 that's why the detection limit on this day was not down at
18 the very low levels we recorded previously.

19 Q I see. Now the second sample on Table 2 is listed
20 as 35 up to 50° centigrade. Would you describe how you took
21 that sample?

22 A Yes. We heated the water surrounding the plastisol
23 which was inside of the sealed early minor flask and we ran
24 samples continuously as we increased the temperature of the
25 water from the 35 to 50° centigrade. 50° centigrade would

1 probably correspond--well, I'd like to have the centigrade-
2 Fahrenheit conversion. We'll leave it at centigrade, but
3 once again, we did not detect any vinyl chloride^{and} this
4 indicated less than 0.01 per one million vinyl chloride.

5 Q When you report 0.01 parts per million, does that
6 necessarily mean any vinyl chloride is present?

7 A Once again, we would have to use common sense and
8 say that there was vinyl chloride everywhere in our house, so
9 I cannot testify there was no vinyl chloride there. However
10 the analytical technique indicated to me that there was less
11 than zero percent parts per million of vinyl chloride.

12 Q In Table 2, there is a third reading which says,
13 "in boiling water". Would you describe how that was made?

14 A We heated the water to boiling and as soon as we
15 got the water up to boiling we took samples of the gas in this
16 container to the gas chromatograph mass spectrometer.

17 Q And the result obtained was what?

18 A The result obtained was 0.04 parts per million
19 vinyl chloride.

20 Q Then the fourth sample you have listed in Table 2
21 is, "after 20 min. in boiling water". Will you please describe
22 how you took that sample?

23 A Yes, I will. This sample was taken clinically to
24 the other samples, but one must realize when you have a poly-
25 vinyl chloride in this Hysol mixture and you are heating it

1 to 1700° centigrade, the vinyl chloride monomer is slowly
2 coming out of the Hysol mixture. And as a result, you'd
3 expect the level of vinyl chloride monomer to drop, which
4 indeed it has down to 0.01 parts per million which was quite
5 easily detectable on that day.

6 MRS. MC KEE: I'd like to offer R-7, Table 2, into
7 evidence. And as I said before, I'd like to make an
8 offer of proof on Tables 1 and 3.

9 JUDGE DIXON: Tables 1 and 3, you are allowed to
10 make an offer of proof. In other words, it's all in-
11 corporated in the same Exhibit.

12 MRS. MC KEE: I'm not trying to do anything--

13 JUDGE DIXON: Table 2--Mr. DeShazo:

14 MR. DE SHAZO: Your Honor, the way these are set up,
15 I assume there would be no problem in cutting Table 2
16 off here and renumbering them.

17 JUDGE DIXON: I just read a recent case where it
18 said an offer of proof should be preserved in the record.
19 I just read the case in the past two weeks.

20 MR. DE SHAZO: I don't mind it being preserved. I
21 would rather it was preserved in the folder and not at
22 all considered by the Judge.

23 JUDGE DIXON: I've heard the dissertation on it. So
24 in other words, rather than start chopping up Exhibits,
25 I am excluding Table 1 and Table 3 in connection with

1 any conclusions found there by the witness. And then
2 there is the offer as to Table 2, the admission of the
3 Exhibit. We'll call it R-7--Table 2, and this--

4 MR. DE SARZO: May I ask a couple of voir dire
5 questions of the witness?

6 JUDGE DIXON: --this is his analysis of the Hysol.

7 VOIR DIRE EXAMINATION

8 BY MR. DE SARZO:

9 Q As I understood the testimony of Mr. Widner earlier,
10 he said that the volume of the PVC in that particular tank,
11 that we are concerned with today, was not--may have some
12 significance, but was not particularly ^{sign}ificant, it was
13 really the surface area of the PVC that we were concerned
14 with. So that if the tank has two or three gallons in it,
15 it's still the same ^{surface} area; in that respect, it wouldn't
16 be any more--it probably wouldn't release any more vinyl
17 chloride than perhaps one gallon having the same surface
18 area in that tank, is that correct?

19 A I would have to partially disagree.

20 Q Would you explain what portion of that statement
21 you disagree with?

22 A That maybe ⁱⁿ a large body of PVC, you have more
23 vinyl chloride monomer present which potentially can escape.

24 Q In the particular tank in question, would it be a
25 fair statement that essentially what we are concerned with is

1 the surface area that is exposed?

2 A I don't know the answer to that question.

3 Q Do you have any opinion as to the amount of vinyl
4 chloride being given off from the tank as a whole, given its
5 total surface area, with respect to the amount of vinyl
6 chloride you are able to extract from a small sample drawing
7 it up, or bubbling it up, through this very small glass
8 tube?

9 A Yes, I do.

10 Q What is your opinion on that?

11 A My opinion is that the important consideration is
12 with regard to the level of vinyl chloride that is built up;
13 the ratio of the quantity, or the volume of air, above the
14 plastisol in question to the quantity of plastisol under the
15 air.

16 Q In other words, your test in Table 2 of bubbling
17 air up through the given amount of this substance in a small
18 glass tube really doesn't have any great significance with
19 respect to the amount of vinyl chloride that's being given
20 off from the whole tank?

21 A I disagree very strongly.

22 Q The only reason for bubbling air through the given
23 quantity that you have is to increase the surface area,
24 isn't it?

25 A There's a twofold reason for bubbling air through
the mixture. I consider just passing a small amount of air

1 through the head space of any plastisol solution and then
2 doing an analysis on this residual air--we have to have this
3 light flow of air in order to fill the sample which is going
4 into this gas chromatograph, and that's the reason for the
5 flow of air.

6 But I decided rather than doing that I would ex-
7 agerate the case and force the air right through the Mysol
8 plastisol mixture. This is really an exaggeration of the
9 case where you just have the material just laying there in
10 a dormant state, because the vinyl chloride monomer is
11 leaving the top of the solution. And then you have to have
12 migration of the vinyl chloride from the ^{bottom of the} solution to the top.
13 Here you are physically disturbing the solution and mixing it.

14 As you say, you are increasing the surface area.
15 And if anything, this test is exaggerating the situation that
16 would be found in the field.

17 JUDGE DIXON: One question. Did you anywhere
18 approximate the 350° temperature that the Mysol was
19 used in the plant?

20 THE WITNESS: I did not.

21 JUDGE DIXON: You didn't approximate the 350°
22 operation to see whether that would generate the release
23 of gas particles?

24 THE WITNESS: No. I did not.

25 MR. DE SHAZO: I would object to the offer of

UNITED STATES OF AMERICA
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

SECRETARY OF LABOR,

Complainant

v.

WESTERN ELECTRIC,

Respondent

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) OSAHRC DOCKET NO. 8902
)
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APPEARING ON BEHALF OF COMPLAINANT:

EUGENE F. DeSHAZO, ESQ., Office of the Solicitor,
U. S. Department of Labor, 911 Walnut Street, Kansas
City, Missouri

APPEARING ON BEHALF OF RESPONDENT:

LAUREL J. McKEE, ESQ., Western Electric, 195 Broadway,
New York, New York

Hearing held January 8, 1975, Federal Building, Room 140,
601 East 12th Street, Kansas City, Missouri, Judge Paul E.
Dixon presiding.

JURISDICTION

Paul E. Dixon, Judge:

This is an action under section 10(c) of the Occupational Safety and Health Act of 1970, 29 USC 651 et seq. (hereinafter referred to as the Act), contesting a citation for non-serious violation as a result of an inspection by the Department of Labor made on May 31, 1974, at a place of employment located at 777 North Blue Parkway, Lee's Summit, Missouri, where respondent was engaged in work of manufacturing component parts and assembly of electronic devices.

Timely notice of contest was made by the respondent, and following the issuance of complaint and response by respondent the case was brought to issue.

THE CITATION

The citation for non-serious violation issued June 17, 1974, alleged violation of 29 CFR 1910.93q(c)(1) in that:

"Employer uses a coating, Hysol Coating CG7-4331, containing polyvinyl chloride and did not monitor the ambient air of the area to determine whether it contains vinyl chloride in concentrations in excess of 50 ppm. (Inductor, Building 50, vicinity of column G-7)."

An abatement date of July 19, 1974, was established,

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and a penalty in the amount of \$30.00 was imposed.

THE STANDARD

"29 CFR 1910.93q Vinyl chloride.

(c) Monitoring--

(1) Initial monitoring. As soon as possible but not later than April 22, 1974, every employer of an employee working in an area or operation in which vinyl chloride is manufactured, reacted, handled, processed, released, repacked, or stored shall begin monitoring the ambient air of the area to determine whether it contains vinyl chloride in concentrations in excess of 50 ppm."

THE ISSUES

1. Did respondent have an employee or employees working in an area or operation in which vinyl chloride is manufactured, reacted, handled, processed, released, repacked or stored.
2. If so, was the ambient air monitored in accordance with the appropriate standard.
3. Does the exception of 29 CFR 1910.93q(a)(2) of the standard apply, in that the exemption to the standard is the handling, storage, or other use of vinyl chloride polymers and copolymers in the form of fabricated products.
4. Did the process of respondent dipping its coils into a tank containing Mysol heated to a temperature of 360°F to coat the coils constitute the use of vinyl chloride polymers and copolymers in the form of fabricated products.

FINDINGS OF FACT

1. Western Electric is a corporation with an office and place of business at 777 North Blue Parkway, Lee's Summit, Missouri, and is known as Kansas City Works, where it is engaged in manufacturing electronic components.
2. In June 1974, Western Electric employed approximately 5,076 employees at its place of business in Lee's Summit, Missouri, has been and is engaged in a business affecting commerce, and is an employer within the meaning of the Act.
3. As the result of an inspection on May 31, 1974, by compliance officer Stewart, an authorized representative of the Secretary of Labor, a citation and notification of proposed penalty were issued to Western Electric on June 17, 1974, and were received by Western Electric on June 18, 1974.
4. On July 11, 1974, Western Electric filed a notice of contest, which was duly transmitted to the Occupational Safety and Health Review Commission.
5. Western Electric maintains an extensive safety program at its Kansas City Works which is coordinated by three full time safety administrators and two full time industrial hygienists (T. 94).
6. The Kansas City Works does not use vinyl chloride (VC) or polyvinyl chloride (PVC) resin as a raw material (T. 92).
7. The Kansas City Works does use Hysol plastisol which contains polyvinyl chloride compound (T. 133).

8. In early May 1974, Mr. Widner, an industrial hygienist at the Kansas City Works, began testing for the presence of vinyl chloride (T. 97).

9. Mr. Widner monitored the operation at the Works, which he judged would produce the highest vinyl chloride reading, the welding of polyvinyl chloride sheets (T. 98).

10. Mr. Widner's monitoring of the welding of PVC sheets resulted in readings of parts per billion of vinyl chloride (T. 101).

11. Mr. Widner took no immediate action to monitor other plant operations for vinyl chloride (T. 100-101).

12. On May 31, 1974, compliance officer Stewart inspected the Kansas City Works for violations of the Occupational Safety and Health Act. He conducted his investigation in the prescribed manner and monitored a process located in Building 50 for vinyl chloride. (T. 12-13; 101)

13. The process that he monitored was a coil coating operation, and consisted of the following successive steps:

- a. Forty-nine coils are clipped to a rack.
- b. The rack and coils are placed into an oven at approximately 360°F and allowed to reach this temperature.
- c. After reaching 360°F, the operator reaches into the oven, pulls the rack and places the rack in a jig above the tank and lowers the hot coils into the Hysol material contained in the tank.
- d. The tank is labeled polyvinyl chloride and the

heated coils are submerged in the tank, which contains Hysol at room temperature, for approximately 20 minutes.

e. After removal, the coils are placed in an oven heated to 360°F, which is vented, for a period of five minutes.

f. The rack and attached coils are then removed from the oven and allowed to cool.

g. The coils are then covered with an insulating material as a result of this dip operation (T. 106-108).

14. The Hysol utilized by respondent was one-half polyvinyl chloride compound dispersed in a liquid plasticizer. The liquid plasticizer was two-thirds dioctyl phthalate and one-third esters. (T. 19; 108)

15. Polyvinyl chloride (PVC) is a solid substance. Vinyl chloride (VC) is a gas. (T. 19)

16. "Dispersed" means that the PVC was finely ground into small particles which were then suspended in the liquid plasticizer (T. 19).

17. The supplier of Hysol reported to Western Electric that Hysol contained no hazardous ingredients (T. 131).

18. Western Electric did not monitor the coil-dipping process for vinyl chloride before May 31, 1974.

19. Compliance officer Stewart took samples on June 3, 1974, at the following places:

a. One sample from a tube hung on an employee working on the opposite side of the tank and 6 feet away

(T. 114); this sample corresponds to National Institute of Safety and Health (NIOSH) laboratory number W-9075 (T. 39-40; 114).

b. Two samples from tubes placed directly under the lid of the tank; these samples correspond to NIOSH laboratory numbers W-9077 and W-9078 (T. 37; 41; 51).

20. The samples taken by compliance officer Stewart were analyzed by the NIOSH laboratory in Salt Lake City by means of a gas chromatograph-flame ionization detector (T. 69).

21. The results of the NIOSH laboratory analysis were as follows:

a. W-9075: Less than 2 ppm;

b. W-9077: 1.7 ppm; and,

c. W-9078: Less than 2 ppm (T. 80; 82).

22. The finding of less than 2 ppm in samples W-9075 and W-9078 means that no vinyl chloride was detected (T. 80).

23. No vinyl chloride detected means that the results were below the detection limit of the analysis, which limit was set at .3 ppm (T. 80).

24. There was no testing of the samples at a temperature of 350°F by either the NIOSH laboratory in Salt Lake City or by Western Electric's Engineering Research Center in Princeton, New Jersey (T. 192).

25. The product Hysol, as it is used by Western Electric, is subjected to a temperature of 350°F when the coils

are dipped, where it melts and forms a polyvinyl chloride coating, capsulating and bonding to an electric component (T. 14-30).

26. At employees' polyvinyl chloride dip tank there are approximately three employees working (T. 17).

27. The dip tank is approximately 18 by 24 inches in configuration.

28. The immediate and surrounding workarea is equipped with chemical laboratory ventilation hoods (T. 15).

29. Vinyl chloride has an extremely low boiling point which starts out in a gaseous state, and by means of compression and adding other materials as a catalyst the individual molecules of vinyl chloride become attached to each other, so that it ends up a solid (T. 20-21).

30. One employee is principally involved in the dipping operation (T. 24).

31. The heating of the Hysol product is to allow the suspended dispersed polyvinyl chloride to go into solution with the plasticizer (T. 26).

32. This material then becomes firm and fuses to the product, creating an insulation (T. 26-27).

33. When the product Hysol, as utilized by Western Electric, is subjected to a heat of 350°F, it gives off vinyl chloride gas (T. 14-30; 132).

34. Mr. Widner took samples on June 11, 1974, at the tank of Hysol previously described (T. 118).

35. Mr. Widner took four samples on June 25, 1974, at the tank of Hysol previously described (T. 119).

36. The samples taken were sent to Western Electric's Engineering Research Center in Princeton, New Jersey, for analysis (T. 118-119).

37. These samples were analyzed at the Engineering Research Center by means of a gas chromatograph and mass spectrometer (T. 119).

38. The Hysol material was also analyzed by means of a gas chromatograph and mass spectrometer, which analysis yielded the following results:

- a. Room temperature: Less than .01 ppm;
- b. 35° - 50°C: Less than .01 ppm;
- c. In boiling water: .04 ppm; and,
- d. After 20 minutes in boiling water: .01 ppm (T. 187-189).

DISCUSSION

Respondent takes issue with the NIOSH findings of the presence of vinyl chloride gas, on the basis of the provisions of 29 CFR 1910.93q(c)(3), method of monitoring, arguing that the monitoring need only be sensitive to 5 ppm, and since the only definite reading obtained by the Department of Labor was 1.7 ppm respondent's process did not "release" vinyl chloride.

This Writer disagrees with respondent's interpretation

of this particular standard, in that the standard merely describes the method of monitoring to be employed by the compliance officer, in that samples are to be collected by suitable devices worn by the employee. The samples shall be analyzed by gas chromatography or by any other method which is of equivalent sensitivity. The analytical procedures shall be sensitive to 5 ppm of vinyl chloride in an air with an accuracy of $\pm 20\%$ for a 10-minute air sample.

In other words, simply stated, the method of monitoring shall utilize a device which is capable of measuring sensitivity to a point of 5 ppm of vinyl chloride.

The standard does not say that if there is less, this indicates the non-presence of vinyl chloride gas.

Respondent's argument as to its laboratory test results showing that the presence of vinyl chloride gas at room temperature was not detectable was not tenable, in that the respondent's operation involved temperatures of 350°F in the use of its Hysol product, and with the correlation of the sum total of the various expert witnesses would be indicative of a greater release of vinyl chloride gas at a higher temperature than at room temperature.

Respondent's argument that the coil coating process utilizing the Hysol substance was a use that fell within the purview of the exemption of the emergency standard contained in 29 CFR 1910.93q(a)(2), as to fabricated products,

is equally untenable.

As this trial Judge ruled at the time of the hearing, which ruling was reinforced by the later reported case of Society of the Plastic Industry, Inc., et al. v. United States Department of Labor, et al., ___F.2d___ (2d Cir. January 31, 1975), 3 CCH, Employer's Safety and Health Guide, section 19,248, the respondent's operation in coating the coil was a form of fabrication.

The Court stated in discussing the background of the vinyl chloride industry at CCH, p. 23,020:

"Innumerable firms throughout the country, employing thousands of workers, compound PVC with plasticizers, heat stabilizers, lubricants, light stabilizers, flame retardants, or impact modifiers to produce an astounding variety of wares, such as pipes and conduits for building and construction, flooring, wire and cable, furniture, phonograph records, and packaging. In fabrication, residual VCM [vinyl chloride monomer] that has been entrapped in the PVC resin escapes during the heating process, and in this way workers in the fabricating industry are also exposed to vinyl chloride."

And, at p. 23,024, CCH:

"If, in the future, the monitoring under the standard indicates that the VCM [vinyl chloride monomer] level among fabricators is sufficiently low and that the sporadic, unpredictable exposure of these workers to residual VCM [vinyl chloride monomer] has been controlled, the fabricators might well be excluded or included in a separate, less rigorous standard. Certainly if PVC producers were able to eliminate all residual VCM [vinyl chloride monomer] from the resin before it is delivered to the fabricator, there would seem to be no reason

for their inclusion. But this would be for the Secretary to decide on appropriate application or on his own motion, and, as the record presently stands, their inclusion is amply justified."

The respondent has an exemplary safety and health program in its operations and has highly qualified personnel attending to this program. Respondent's operation at the dip tank was infrequent, and the lack of monitoring was due to either oversight or a misinterpretation of the standard.

Respondent is highly conscious of its responsibilities to its employees, and this was quite apparent in the testimony of respondent's representatives and that of the compliance officer, who was exceedingly complimentary of respondent's general operations.

In this connection, it is felt that the imposition of a monetary penalty would serve little, if anything, to effectuate the Act, in that respondent has a demonstrated eagerness to be in full compliance with the Act. However, the respondent was in violation, in that it did not monitor its dip tank operation, which although performed infrequently did give rise to the release of vinyl chloride gas and there was employee exposure.

CONCLUSIONS OF LAW AND ORDER

1. Respondent was an employer under the Act.
2. Respondent was in violation of 29 CFR 1910.93q(c)(1),

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in that in its use of the Hysol material coating compound at its dip tank operation there was a release of vinyl chloride gas.

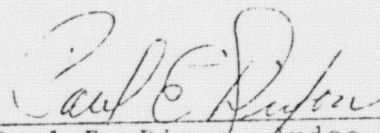
3. Respondent did not monitor the ambient air of the area to determine whether it contained vinyl chloride in concentrations in excess of 50 ppm.

4. The area did not contain vinyl chloride concentrations in excess of 50 ppm.

5. The abatement period of July 19, 1974, is appropriate and is affirmed.

6. No penalty is assessed.

DATE: August 14, 1975


Paul E. Dixon, Judge, OSAHRC

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UNITED STATES OF AMERICA
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

PETER J. BRENNAN, SECRETARY OF LABOR :
UNITED STATES DEPARTMENT OF LABOR, :

Complainant, :

v. :

WESTERN ELECTRIC COMPANY, INC., :

Respondent. :

OSAHRC DOCKET

NO. 8902

PETITION FOR REVIEW



ROBERT A. LEVITT

LAUREL J. McKEE

ATTORNEYS FOR
WESTERN ELECTRIC COMPANY, INC.
222 BROADWAY
NEW YORK, NEW YORK 10038

August 12, 1975

Western Electric Company, Inc., is engaged in manufacturing electronic components at its Kansas City Works which is located in Lee's Summit, Missouri. There it employs approximately 5,000 employees.

Western Electric Company hereby petitions for review of the decision issued by Judge Dixon in this matter because the decision:

- (1) ignores the clear definition of "fabricated products" contained in the vinyl chloride Standard when it concludes that liquid Hysol used by Western Electric was not a "fabricated product"; and
- (2) the decision adopts an erroneous definition of "released" as used in the emergency vinyl chloride Standard.

On May 31, 1974, Compliance Officer Stewart from the U.S. Department of Labor, inspected the Kansas City Works for violations of the Occupational Safety and Health Act. In the course of his investigation he monitored a coil coating process. In the coil coating process, 49 coils were clipped to a rack which was then heated in a vented oven at 360° Fahrenheit and the coils were allowed to come to that temperature. The heated coils were then submerged

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into a tank containing Hysol at room temperature for approximately 20 seconds, long enough for the coils to cool. Then the rack and coils were lifted out of the Hysol, blown off and returned to the oven for five minutes at 360° Fahrenheit. The rack and coils were finally removed from the oven and allowed to cool. This operation was and is run about once a month. The Hysol in the tank monitored by C. O. Stewart is half polyvinyl chloride compound and half liquid plasticizer which consists of 2/3 dioctyl phthalate and 1/3 esters.

Western Electric was cited under the emergency vinyl chloride Standard for failure to monitor the coil dipping operation.

Western Electric filed a Notice of Contest and a hearing was held on January 8, 1975. At the hearing, and in its post-hearing brief, Western Electric acknowledged it had not monitored the process but argued that the Standard did not require monitoring of the coil dipping process. Judge Dixon issued his decision and found that the emergency vinyl chloride Standard required Western Electric to monitor the coil dipping process. Western Electric has filed this petition for review because Judge Dixon erroneously defined two key terms in the Standard.

First, the temporary vinyl chloride Standard clearly does not apply to use of "fabricated products."

3.

"This section does not apply to the handling, storage, or other use of vinyl chloride polymers and copolymers in the form of fabricated products." (Emergency Standard, §1910.93q(a)(2))

Likewise, the Permanent Standard published on October 1, 1974, to be effective January 1, 1975, also does not apply to the handling or use of fabricated products:

"This section applies to the manufacture, reaction, packaging, repackaging, storage, handling or use of vinyl chloride or polyvinyl chloride but does not apply to the handling or use of fabricated products made of polyvinyl chloride." (Emergency Standard §1910.93q(a)(2))

Although the Emergency Standard does not define fabricated product, the phrase is defined in the Permanent Standard:

"'Fabricated product' means a product made wholly or partly from polyvinyl chloride, and which does not require further processing at temperatures, and for times, sufficient to cause mass melting of the polyvinyl chloride resulting in the release of vinyl chloride." (§1910.93q(b)(6))

Clearly, the Hysol used by Western Electric is a "fabricated product" within the definition since it did not require processing at temperatures and at times "sufficient to cause mass melting." The Hysol mass in the tank was never itself heated during the process to anywhere near its melting point.

Thus, Judge Dixon erroneously concluded that Hysol was not a fabricated product.

Second, the Emergency Standard required monitoring of the ambient air for VC in areas or at operations where:

"Vinyl chloride is manufactured, reacted, handled, processed, released, repacked, or stored." (Emergency Standard §1910.93q(c)(1))

Western Electric, however, did not use VC as a raw material at its Kansas City Works and thus, did not manufacture, react, handle, process, repack or store VC. While VC escaped in the coil coating process, but VC was not "released" within the meaning of the standard because the amount of VC which escaped during the process was far below the required sensitivity level of the analytical procedure specified in (c)(3) of the standard for measuring VC. Both (c)(1) and (c)(3) must be read together in order to give sense and meaning to both sub-sections.

The Standard required that in monitoring the release of vinyl chloride, an employer must use an analytical procedure which has a sensitivity of 5 ppm. (Emergency Standard, 29 C.F.R. §1910.93q (c)(3).

Thus, the sensitivity required of the analytical procedure must necessarily set the lower limit for release of VC. Such reading together of subsections (c)(1) and (c)(3) is required to make sense out of the standard which would otherwise require monitoring of everything that emitted any VC. Such a comprehensive requirement

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would be unreasonable and unrealistic since everything made from PVC emits at least one or two molecules of VC.

The unreasonableness of adopting any other reading of subsections (c)(1) and (c)(3) is particularly obvious in this case. Here, if Western Electric had monitored the coating process by a method sensitive to 5 ppm, it would have found nothing since the highest VC reading obtained by the Department of Labor was 1.7 ppm and therefore would not have been detected by an analytical procedure sensitive to 5 ppm as required by the Standard.

Thus, Judge Dixon erroneously concluded that vinyl chloride was "released" within the meaning of the Emergency Standard.

Respondent thus petitions for review of the decision.

Respectfully submitted,

ROBERT A. LEVITT

LAUREL J. McKEE

ATTORNEYS FOR
WESTERN ELECTRIC COMPANY, INC.
222 BROADWAY
NEW YORK, NEW YORK 10038

August 12, 1975

UNITED STATES OF AMERICA
OCCUPATIONAL SAFETY AND HEALTH REVIEW COMMISSION

SECRETARY OF LABOR,

Complainant

v.

WESTERN ELECTRIC, INC.,

Respondent

OSHR DOCKET NO. 8902

DECISION

Before BARNAKO, Chairman; MORAN and CLEARY, Commissioners.

BARNAKO, Chairman:

The issue in this case is whether Respondent (Western Electric) violated the monitoring requirement of the emergency temporary standard for vinyl chloride.^{1/} Western Electric was cited for allegedly failing to monitor an operation in which a solution containing polyvinyl chloride

^{1/} The temporary standard was promulgated on April 5, 1974, and was codified at 29 C.F.R. §1910.93q. 39 F.R. 12343 (April 5, 1974). It was superseded on January 1, 1975 by a permanent standard, now codified at 29 C.F.R. §1910.1017. 39 F.R. 35890 (Oct. 4, 1974). The temporary standard established an exposure limit of 50 parts per million (ppm). The monitoring provision states as follows:

1910.93q(c) Monitoring. (1) Initial monitoring. As soon as possible, but not later than April 22, 1974, every employer of an employee working in an area or operation in which vinyl chloride is manufactured, reacted, handled, processed, released, repacked, or stored shall begin monitoring the ambient air of the area to determine whether it contains vinyl chloride in concentrations in excess of 50 ppm.

was utilized to encapsulate wire coils at its plant in Lee's Summit, Missouri. It defended on the basis that (1) VC was not "released" during the encapsulation process within the meaning of the standard; and (2) the PVC solution was a "fabricated product" and therefore excluded from the standard.^{2/} Judge Paul E. Dixon rejected both arguments and affirmed the citation. For the reasons which follow, we reverse his decision.

Vinyl chloride (VC) is a gas at room temperature. Inhalation of excessive amounts can result in angiosarcoma, a rare form of liver cancer. The discovery of VC's carcinogenic property led to the promulgation of first the temporary standard, and later the permanent standard. See generally, Society of the Plastics Industry, Inc. v. U. S. Department of Labor, 509 F.2d 1301 (2d Cir. 1975), cert. denied, 421 U. S. 992 (1975).

Polyvinyl chloride (PVC) is manufactured from VC. At room temperature, PVC is a plastic found in many common products. PVC itself presents no inhalation hazard. When PVC is manufactured, however, a certain amount of VC gas becomes trapped inside the solid material. Some of this gas escapes at room temperature. The rate of escape accelerates as PVC is heated. The application of heat, however, does not cause PVC molecules to change into VC. Thus, the total amount of VC that can be released from a mass of PVC is limited to the amount trapped inside when the PVC was manufactured.

Western Electric utilizes PVC in a process whereby wire coils are coated with a layer of insulation. A rectangular tank, approximately

^{2/} Section 1910.93q(a)(2) provides:

This section does not apply to the handling, storage, or other use of vinyl chloride polymers and copolymers in the form of fabricated products.

18 by 24 inches in area, contains one to two gallons of a liquid designated Hysol CG7-4331. The liquid consists of 55% fine particles of PVC suspended in a plasticizer. A number of wire coils, shaped like doughnuts and approximately one inch in diameter, are heated in an oven to 360°F. They are then immersed in the tank for 20 seconds. After they are removed from the tank, they are heated in the oven for five minutes and then allowed to cool. The tank is covered except when the coils are in it. The coating operation is performed approximately once per month.

Western Electric employs approximately 4700 persons at its Lee's Summit plant. Among these are two full-time industrial hygienists. At the time the emergency temporary standard was promulgated, Western Electric had already instituted a company-wide program to determine whether VC presented a hazard to any of its employees. It also developed a sophisticated analytical method to measure the airborne concentration of VC.^{3/}

One of Western Electric's industrial hygienists, Widner, thought that the emergency temporary standard applied only to operations which used VC as a raw material, or used PVC resin to manufacture products of PVC. He concluded that, although Western Electric utilized PVC products in several areas of its plant, it was not subject to the standard because it used no raw PVC resin. Nevertheless, he did monitor one operation in the plant to determine the amount of VC released. The operation monitored was one in which sheets of PVC are welded together to make exhaust ducts.

^{3/} Western Electric's technique used a mass spectrometer in conjunction with a gas chromatograph. Complainant's chemist testified that this was far superior to the method he employed, which utilized only a gas chromatograph.

Widner thought that, of all the operations in the plant utilizing PVC, this would result in the release of the greatest amount of VC. The concentration of VC measured was in the range of several parts per billion.^{4/} This result reinforced Widner's conclusion that the levels of VC in all areas of the plant were well below the level of 50 ppm specified in the standard. Accordingly, he decided it was unnecessary to monitor the other operations in which PVC is used.

On May 31, 1974, the plant was inspected by Complainant's industrial hygienist, who sampled the coil coating operation for VC. Thereafter, Western Electric also took VC samples around the tank. Much of the evidentiary record is devoted to the analytical procedures used to analyze these samples, and to the results obtained. Both parties challenge the results obtained by the other on various grounds. For our present purposes, however, the exact concentration is unimportant. It is sufficient to observe that the highest concentration measured by Complainant was 1.7 ppm, or approximately one-thirtieth of the 50 ppm limit established by the standard.^{5/}

Complainant contends that because some amount of VC, however small is "released," Western Electric violated the standard by failing to monitor

^{4/} One part per billion is 1/1000 of a part per million. Thus, the level of 50 ppm specified in the standard would equal 50,000 parts per billion.

^{5/} We also note, however, that this concentration was measured inside the lip of the tank. Complainant's breathing zone sample yielded no measurable concentration when analyzed with a technique sensitive to 0.3 ppm. We also note that §1910.93q(c)(3) requires that the monitoring procedure only be sensitive to 5 ppm.

the coil coating operation. In Complainant's view, it is unimportant how much VC is in fact released, because this is the very information sought to be obtained by the monitoring requirement. He argues that this interpretation of the standard is suggested by our decision in GAF Corporation, Docket No. 3203, BNA 3 OSHC 1686, CCH OSHD para. 20,163 (1975), pet. for review filed, No. 76-1028 (D.C. Cir., Jan. 13, 1976).

Western Electric points out that any operation involving PVC, even those in which the PVC is at room temperature, results in the "release" of at least a few molecules of VC. It contends that the standard was obviously not intended to require monitoring when only a negligible amount of VC is released in a process utilizing PVC. Western Electric argues that, since the standard specifies a sensitivity requirement of 5 ppm for the analytical process, it should only be read to apply to concentrations in excess of 5 ppm.

We do not entirely agree with either party's suggested interpretation of the standard. Complainant would have us read the standard to require monitoring of every operation where VC is released without regard to whether there is any realistic possibility that the 50 ppm limit of the standard may be approached. The express purpose of the monitoring requirement, however, is "to determine whether (the ambient air) contains vinyl chloride in excess of 50 ppm." If it can be reliably predicted from the physical circumstances that the concentration of VC will be well below 50 ppm, then formal monitoring would be a useless act, and it is unreasonable to interpret the standard to require such an act.

Furthermore, Complainant's interpretation would give a greater scope to the emergency temporary standard than was intended when the standard was promulgated. At that time, Complainant stated in the preamble to the standard:

...It has been decided to promulgate a standard containing only those essential provisions which are deemed necessary to provide protection to employees from grave danger until a regular rulemaking proceeding in accordance with sections 6(b) and (c) of the Act can be concluded....39 F.R. 12342 (April 5, 1974). (Emphasis supplied).^{6/}

This statement of the purpose of the standard is inconsistent with an interpretation which applies the standard to every employment situation utilizing PVC in any manner except as a "fabricated product". The standard was intended to protect employees, not to require monitoring for its own sake.

On the other hand, it would also be unreasonable to have the monitoring requirement depend on the existence of a particular minimum level of VC, as Western Electric urges. We cannot use hindsight to say that monitoring was not required simply because, after monitoring, the concentration proves to be below a certain level.

The record shows, however, that Western Electric's decision not to monitor the coil coating process was based, not on hindsight, but on foresight. It had monitored one operation which it thought was likely to result in a higher concentration of VC than the coil coating operation. It discovered that only a negligible amount of VC was released in the welding operation. This result, coupled with Western Electric's understanding

^{6/} Pursuant to 29 U.S.C. §655(c), an emergency temporary standard to protect employees from "grave danger" may be promulgated without resort to rulemaking proceedings. Upon promulgation of such a temporary standard, a regular rulemaking proceeding leading to the promulgation of a permanent standard must be commenced.

of the process by which VC is released from PVC, strongly suggested that the amount of VC released in the coil coating operation would also be negligible compared to 50 ppm. Nothing in the record casts doubt on the validity of this judgment, or on the good faith with which it was made. Under these circumstances, we cannot conclude that Western Electric violated a standard intended only to protect employees from grave danger.

A contrary result is not suggested by our decision in GAF Corporation, supra. That case involved the interpretation of a standard which required that medical examinations be provided to "employees who are engaged in occupations exposed to airborne concentrations of asbestos fibers." We rejected the argument that the standard only required medical examinations for employees exposed to concentrations of asbestos exceeding the limits provided in the asbestos standard.

Our decision in this case is consistent with that in GAF. In both cases, we have rejected the argument that the requirements of the respective standards only become operative when a particular minimum value of the air contaminant is shown to exist. Furthermore, GAF did not involve the situation in this case, where the concentration of the air contaminant is negligible compared to the limit established by the standard.

Western Electric alternatively argues that the Hysol liquid it used was a "fabricated product", and therefore exempt from the standard. The emergency temporary standard contains no definition of "fabricated product."

The permanent standard does, however, contain such a definition.^{7/} Western Electric contends that, under this definition, the Hysol liquid is a fabricated product. Complainant would have us read the same definition and reach the opposite conclusion.

Since we have concluded that Western Electric did not violate the standard, it is not necessary to reach the issue of whether the Hysol liquid is a fabricated product. We note, however, that it would be anomalous to apply a definition to the emergency temporary standard which was not operative until the temporary standard was superseded. Whether the Hysol liquid is a fabricated product" within the definition in the permanent standard can only appropriately be determined in a case arising under that standard.

Accordingly, the Judge's decision is reversed and the citation is vacated.

FOR THE COMMISSION:

William S. McLaughlin
WILLIAM S. McLAUGHLIN
EXECUTIVE SECRETARY

DATE: JAN 24 1977

BY: *Gloria W. White*
Gloria W. White
Assistant Executive Secretary

7/ 29 C.F.R. §1910.1017(b) provi

Fabricated product means a product made wholly or partly from polyvinyl chloride, and which does not require further processing at temperatures and for times, sufficient to cause mass melting of the polyvinyl chloride resulting in the release of vinyl chloride.

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MORAN, Commissioner, Concurring:

I agree with the lead opinion except that I disassociate myself from its discussion of Secretary v. GAF Corporation, OSAHRC Docket No. 3203, November 14, 1975.

CLEARY, Commissioner, DISSENTING:

The majority's interpretation of the standard at issue in this case is contrary to its clear meaning. Moreover, in reaching their erroneous reading of the standard my colleagues have ignored precedent limiting this Commission's role in the interpretation of an occupational safety and health standard.

In pertinent part, the initial monitoring requirement of the emergency temporary standard for vinyl chloride is as follows:

§1910.93q Vinyl chloride.

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- (c) Monitoring. (1) Initial monitoring.
As soon as possible, but not later than April 22, 1974, every employer of an employee working in an area or operation in which vinyl chloride is . . . released . . . shall begin monitoring the ambient air of the area to determine whether it contains vinyl chloride in concentrations in excess of 50 ppm.

By its terms the standard requires monitoring of employee exposure levels in every operation in which any vinyl chloride is released.

The majority, however, reads differently this unequivocal language. My colleagues would not require monitoring even if vinyl chloride is released "[i]f it can be reliably predicted from the physical circumstances that the concentration of VC will be well below 50 ppm. . . ." This is in error.

I submit that this monitoring standard is by its very nature intended to supplant "reliable predictions." No matter how meticulously

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it is performed a "reliable prediction" cannot be considered as an acceptable alternative to physically monitoring ambient air levels in areas where vinyl chloride is released. Simple logic does not support the majority's action. Moreover, the wording of the standard itself is not amenable to the strained "interpretation" announced in the lead opinion.

Vinyl chloride poses an extremely grave health hazard to thousands of workers. Inhalation of vinyl chloride has been linked to angiosarcoma of the liver, an extremely rare and irreversible cancer. Society of Plastics Industries, Inc. v. O.S.H.A., 509 F.2d 1301, 1306 (2d Cir. 1975), cert. denied, 421 U.S. 992 (1975). The deleterious consequences of employee exposure to vinyl chloride mandate the need for reliable measures of exposure levels in operations where vinyl chloride is released.

The Secretary of Labor plainly recognized this fact when he adopted a standard that required monitoring of work environments where any vinyl chloride gas is released. 8/ Nevertheless, the majority has ignored the Secretary's approach to this grave problem and has, in effect, substituted its own monitoring

8/ In attempting to reject complainant's reading of the standard the lead opinion suggests that complainant's interpretation would give greater scope to the standard than was originally intended. Cited in support of this proposition is language from the standard's preamble noting the standard's intent to protect employees from "grave danger." The Chairman apparently is reading the phrase "grave danger" as some form of limitation upon the monitoring requirement. This is error in my opinion.

The Secretary's use of the phrase "grave danger" should be considered only in the manner it was intended, namely as a simple reference to the grave consequences of vinyl chloride exposure. It was never intended as limiting the duty to physically monitor to only those situations where exposure levels well below 50 ppm cannot be "reliably predicted from the physical circumstances."

standard. By doing so my colleagues are plainly questioning the wisdom of the standard. ^{9/} This Commission has consistently held that it lacks the requisite authority to question the wisdom of standards. Van Raalte Co., Inc., 4 BNA OSHC 1151, 1975-76 CCH OSHD para. 20,633 (No. 5007, 1976) and authorities cited therein.^{10/}

Finally, even if I were to assume that the unequivocal language of the standard permits the latitude of interpretation presumed in the lead opinion, the majority errs when it rejects the Secretary's interpretation. As the adopting agency, the Secretary's interpretation is entitled to great weight. Indeed, as noted by the Fifth Circuit:

[T]he promulgator's interpretation is controlling as long as it is one of several reasonable interpretations, although it may not appear as reasonable as some other.

Brennan v. Southern Contractors Service, 492 F.2d 498, 501 (5th Cir. 1974) (cited omitted). In my opinion the interpretation urged by the Secretary is the only reasonable interpretation of the standard at issue in this case. The majority errs when it rejects the reasonable interpretation of the standard urged by the Secretary. I would adopt the Secretary's reading which would require initial monitoring in work environments where any amount of vinyl chloride is released. My colleagues' reading of the standard is

^{9/} The lead opinion suggests that the Secretary's version of the standard might require formal monitoring that might later prove to be a "useless act." I submit that formal monitoring that discloses statistically insignificant exposure levels cannot properly be considered a "useless act" if it supplants a "reliable prediction" that if in error might lead to a useless death of an affected employee.

* ^{10/} Moreover, I submit that the practical effect of the majority's holding is to undermine and reject determinations made by the Secretary in promulgating the standard in question as an emergency temporary standard under the terms of 29 U.S.C. §655(c). As such, my colleagues are implicitly questioning the

(contd.)

contrary to its terms and relegates determinations of employee exposure to this extremely harmful substance to educated guesswork.

Further, if Western Electric believes that its techniques are superior to those of the standard it has recourse to the variance procedures under the Act published in 29 CFR Part 1905 in order to obtain particularized relief. The majority's action makes unnecessary the use of this avenue by providing general relief under a general test of reasonableness that has possible harmful implications far beyond the contours of this case.

In sum, there was no dispute that some quantity of vinyl chloride was released into the work environment during respondent's coating operation. Inasmuch as the evidence showed that respondent had not monitored the ambient air in accordance with the standard's requirements, a failure to comply with 29 CFR §1910.93q(c)(1) was shown. I would not, therefore, disturb Judge Dixon's decision affirming the citation. Rather, I would adopt his disposition of the issue noted above and all other issues in the direction for review.

10/ contd.

determinations "... (A) that employees are exposed to grave danger from exposure to substances or agents determined to be toxic or physically harmful or from new hazards, and (B) that such emergency standard is necessary to protect employees from such danger." 29 U.S.C. §635(c)(1).